Schothorst Feed Research

Soybean Meal Quality by Origin:

Economic Value of Hipro Soybean Meal in Least Cost Formulations

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Least Cost Formulations of Animal Feeds in Different Regions for the U.S. Soybean Export Council, American Soybean Association- International Marketing and United Soybean Board

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Introduction

The added value of higher quality soybean meal in feeds for different species is studied in this report with feedstuffs and prices for four regions: Colombia, Peru (indicative for Latin America), The Philippines and Thailand (indicative for Southeast Asia).

Least cost formulations.

The purpose of least cost formulations is to determine the shadow price of feedstuffs like Hipro soybean meal of different qualities (origins) in comparison to other (protein rich) feedstuffs. The shadow price is the maximum price that can be paid for a feedstuff to be used in a feed formulation, this is dependent on:

- Market effects. Mainly the availability and prices of 'competing' feedstuffs, i.e. protein Rich feedstuffs like other quality soybean meals, sunflower seed meal and/or rapeseed meal. Therefore current market and future prices of feedstuffs for the Colombian, Peruvian, Philippine and Thai feed industry when available are used.
- The species for which the feed is formulated, since the feeding or nutritional value of The feedstuff and/or the nutrient restriction vary per species. Therefore three sets of feed formulations are made for swine, layers and broilers each.
- The chemical composition and matrix values of soybean meal (of different origin). The Price effect of differences in a) protein, b) energy and c) digestible amino acid (and phosphorus) were analysed separately by equalizing protein and energy contents for swine and poultry feeds. Both the chemical composition of SBM as well as the effect of processing (crushing) varies and influences the nutritional quality. The nutrient values listed in appendix 1 are averages based on the research of Prof Mateos, individual batches of SBM can vary considerable.

Note that the exact nutritional and economical value of a feedstuff can only be obtained (and compared) if the feeding value (Net Energy or Apparent Metabolisable Energy content and digestible ileal or total tract amino acid content) was determined with the target species (layer, growing pigs or broiler) of all feedstuffs used in the formulation via the same research protocol (for the digestibility experiments). In this formulation the CVB matrix is used for all the feedstuffs and the three different (origins of) soybean meals are compared among each other with matrix values obtained from the research of Prof. G. Mateos (Universidad Politecnica de Madrid, Spain). Therefore the differences in economic value among the three soybean meals with different origins can be determined from the differences in nutritional value from the different matrices.

Matrix nutrient values.

The most important nutrient values per species of the different soybean meals are listed in appendix 1. Note that the nutrients which have a minimum or a maximum restriction or requirement in the formulations influence both the feed cost and shadow prices of feedstuffs. The energy (NE, EV and AME) and the (ileal) digestible amino acids) content are most crucial.

As can be seen from the matrices (see Appendix 1) the different quality soybean meals differ in nutritional value resulting in shadow prices differences in feeds for different species and categories or phases, the main differences are:

1. Protein content. This varies from 46.0% (Arg.) to 46.9% (Brazil).
2. Energy content. U.S. soybean meal has a 2.6% higher NE (swine), 3.0% higher AME- layer and 3.6% higher AME-broiler than soybean meal from Argentina. Brazilian soybean meal is 2.1% higher in NE, 2.1% AME-layer and 2.1% AME-broiler than soybean meal from Argentina.
3. Amino acid profile, amino acid digestibility and digestible phosphorus. U.S. soybean meal has f.i. a 7.9% higher AID lysine (swine) content than soybean meal from Argentina and the TD lysine (poultry) content is 9.2% higher. Brazilian soybean meal has a 2.5% higher AID lysine (swine) content than soybean meal from Argentina and the TD lysine (poultry) content is 2.9% higher.

Table 1: nutritional differences in soybean meals of different origins (see also appendix 1)

	Swine			Layer			Broiler		
	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.
Absolute differences in nutrient value									
Protein%	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2
Energy cal	-40	+10	+50	-48	+20	+68	-39	+30	+69

The current market price of Hipro soybean meal in USD/Mt in the different regions is as follows:

Table 2: Market prices of Hipro soybean meal in different regions

Hipro SBM*	Colombia	Peru	Philippines	Thailand
USD/Mt	471	445	485	495

*Hipro soybean meal is sold on a per unit of protein basis, the average protein content of the generic product used in the formulations is 46.8%.

1. Shadowprices soybean meal in four different regions

1.1 Shadow prices soybean meal by origin. Colombia

Table 3: Differences in value (USD/MT) of the different soybean meals caused by the chemical and nutritional differences among U.S. SBM, Brazilian SBM and Argentinean SBM, based on a Hi Pro SBM price of USD 471/MT for August 2018

	Swine			Layer			Broiler		
	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.
Absolute differences in nutrient value (as table 1)									
Protein%	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2
Energy cal	-40	+10	+50	-48	+20	+68	-39	+30	+69
Value (USD/Mt) differences									
Protein	-5.40	-4.50	1.20	-7.00	-5.50	1.50	-8.50	-6.70	1.90
Energy	-2.40	0.50	3.00	-4.00	1.60	5.70	-4.20	3.20	7.40
Dig. AA *	1.50	17.80	15.90	5.00	8.30	3.20	2.10	8.80	6.60
Total	-6.30	13.80	20.10	-6.00	4.40	10.40	-10.60	5.30	15.90

*Rest caused by differences in amino acid digestibility and mineral content (P). See Appendix 1.

The shadow price of toasted soybeans (market price USD 495) is USD 449.80 in pig, USD 493.50 in layer and USD 622.40 in broiler feeds. In broiler feeds toasted beans have to be used in order to satisfy the linoleic acid requirement in absence of soy oil (a soy oil price is not available).

Hipro soybean meal is therefore the most attractive protein source especially in poultry feeds, next to toasted soybeans and maize DDGS.

Analyses of value differences (USD/Mt) of soybean meal of differing qualities

The value difference caused by each factor is given in table 3 where a comparison is made to Brazilian soybean meal for each species. This analysis is based on the shadow prices in Colombia (Hipro soybean meal USD 471) for August of the different qualities soybean meal. The results are in general applicable to all regions.

A difference of 0.9% crude protein adds or decreases USD 5.40/Mt to the value of Hipro soybean meal in swine feeds, 5.50 in layer feeds and 8.50 in broiler feeds.

Altogether the value differences due to protein content are larger in poultry than swine feeds and largest in broiler feeds. Differences in value due to differences in digestible energy content are largest in broiler feeds and in digestible amino acid and phosphorus content in swine feeds. In conclusion next to the protein content, the digestible energy, amino acid and phosphorus contribute significantly to the value of soybean meal.

Variation in nutrient values

The effect of variation in the nutrient value (4-5%) of soybean meal on the value (market price USD 471/Mt in Colombia for August 2018) is given in the following table.

Table 4: Price effect of variation in nutrient value

	Swine	Layer	Broiler
+/- 100 cal	6.00	8.30	10.80
+/- 4% dig AA	9.80	2.90	3.10
+/- 100 Cal and 4% dig AA	15.80	11.20	13.90
+/- 0.1 g/kg dig P	0.30	0.70	0.40

Variation in the energy content has the largest effect on the value of soybean meal in broiler feeds. Variation in the digestible amino acid content has the most value in swine feeds. A variation of +/- 100 kcal has a USD 8.30/100 kg effect on the Hipro soybean meal value in layer feed, USD 10.80 in broiler feeds and USD 6.00 in swine feed.

Digestible phosphorus has the highest value in poultry feeds. The effects of digestible energy and amino acids on the value of soybean meal are additive.

1.2 Shadow prices soybean meal by origin. Peru

Table 5: Differences in value (USD/MT) of the different soybean meals caused by the chemical and nutritional differences among U.S. SBM, Brazilian SBM and Argentinean SBM, based on a Hi Pro SBM price of USD 445/MT for August 2018

	Swine			Layer			Broiler		
	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.
Absolute differences in nutrient value (as table 1)									
Protein%	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2
Energy cal	-40	+10	+50	-48	+20	+68	-39	+30	+69
Value (USD/Mt) differences									
Protein	-4.80	-3.80	1.10	-6.30	-4.90	1.40	-7.70	-6.00	1.70
Energy	0.00	0.00	0.00	-2.50	1.10	3.60	-3.30	2.60	5.90
Dig. AA *	2.00	11.10	9.00	2.40	4.20	1.80	1.80	5.60	3.80
Total	-2.80	7.30	10.10	-6.40	0.40	6.80	-9.20	2.20	11.40

*Rest caused by differences in amino acid digestibility and mineral content (P). See Appendix

The shadow price of toasted soybeans (market price USD 420) is USD 371.70 in pig, USD 442.60 in layer feeds and USD 441.70 in broiler feeds.

Hipro soybean meal is therefore the most attractive protein source especially in poultry feeds, next to toasted soybeans.

Analyses of value differences (USD/Mt) of soybean meal of differing qualities

The value difference caused by each factor is given in table 5 where a comparison is made to Brazilian soybean meal for each species. This analysis is based on the shadow prices in Peru (Hipro soybean meal USD 445) for August of the different qualities soybean meal. The results are in general applicable to all regions.

A difference of 0.9% crude protein adds or decreases USD 4.80/100 kg to the value of Hipro soybean meal in swine feeds, 6.30 in layer feeds and 7.70 in broiler feeds.

Altogether the value differences due to protein content are larger in poultry than swine feeds and largest in broiler feeds. Differences in value due to differences in digestible energy content are largest in broiler feeds and the differences in value due to digestible amino acid and phosphorus content in swine feeds. In conclusion next to the protein content, the digestible energy, amino acid and phosphorus contribute significantly to the value of soybean meal.

Variation in nutrient values

The effect of variation in the nutrient value (4-5%) of soybean meal on the value (market price USD 445/Mt in Peru for August 2018) is given in the following table.

Table 6: Price effect of variation in nutrient value

	Swine	Layer	Broiler
+/- 100 cal	0.00	5.20	8.50
+/- 4% dig AA	6.30	1.00	1.70
+/- 100 Cal and 4% dig AA	6.30	6.20	10.20
+/- 0.1 g/kg dig P	0.30	0.30	0.30

Variation in the energy content has the largest effect on the value of soybean meal in broiler and layer feeds and variation in the digestible amino acid content has the most value in swine feeds. A variation of +/- 100 kcal has no effect on the Hipro soybean meal value in swine, USD 5.20 in layer feeds and USD 8.50 in broiler feeds.

Variation in the AID (or SID) amino acid content has the largest impact in swine feeds. Variation in the digestible energy content has the largest effect in poultry, especially broiler feeds because these are very concentrated feeds. Digestible phosphorus has an equal value in all feeds. The effects of digestible energy and amino acids on the value of soybean meal are additive.

1.3 Shadow prices soybean meal by origin. The Philippines

Table 7: Differences in value (USD/MT) of the different soybean meals caused by the chemical and nutritional differences among U.S. SBM, Brazilian SBM and Argentinean SBM, based on a Hi Pro SBM price of USD 485/MT for August 2018

	Swine			Layer			Broiler		
	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.
Absolute differences in nutrient value (as table 1)									
Protein%	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2
Energy cal	-40	+10	+50	-48	+20	+68	-39	+30	+69
Value (USD/Mt) differences									
Protein	-5.30	-4.30	1.10	-6.50	-5.10	1.40	-6.80	-5.40	1.60
Energy	-2.90	0.70	3.60	-5.40	2.20	7.60	-4.30	3.40	7.80
Dig. AA *	0.70	17.30	16.50	3.30	9.00	5.70	1.50	9.00	7.20
Total	-7.50	13.70	21.20	-8.60	6.10	14.70	-9.60	7.00	16.60

*Rest caused by differences in amino acid digestibility and mineral content (P). See Appendix

The shadow price of toasted soybeans (market price USD 585) is USD 476.60 in pig, USD 493.90 in layer and USD 531.80 in broiler feeds.

Hipro soybean meal is therefore the most attractive protein source, especially in poultry feeds, next to maize DDGS. Fishmeal is too expensive.

Analyses of value differences (USD/Mt) of soybean meal of differing qualities

The value difference caused by each factor is given in table 7 where a comparison is made to Brazilian soybean meal for each species. This analysis is based on the shadow prices in The Philippines (Hipro soybean meal USD 485) for August of the different qualities soybean meal. The results are in general applicable to all regions.

A difference of 0.9% crude protein adds or decreases USD 5.30/Mt to the value of Hipro soybean meal in swine feeds, 6.50 in layer feeds and 6.80 in broiler feeds.

Altogether the value differences due to protein content are larger in poultry than swine feeds. Differences in value due to differences in digestible energy content are largest in poultry feeds whereas differences in value due to digestible amino acid plus phosphorus content are highest in pig feed. In conclusion next to the protein content, the digestible energy. Amino acid and phosphorus contribute significantly to the value of soybean meal.

Variation in nutrient values

The effect of variation in the nutrient value (4-5%) of soybean meal on the value (market price USD 485/Mt in The Philippines for August 2018) is given in the following table.

Table 8: Price effect of variation in nutrient value (in USD/Mt)

	Swine	Layer	Broiler
+/- 100 cal	7.30	11.20	11.30
+/- 4% dig AA	11.00	2.30	3.90
+/- 100 Cal and 4% dig AA	18.30	13.50	15.10
+/- 0.1 g/kg dig P	0.60	0.90	0.30

Variation in the energy content has the largest effect on the value of soybean meal in layer and broiler feeds and variation in the digestible amino acid content has the most value in swine feeds. A variation of +/- 100 kcal has an effect on the Hipro soybean meal value of USD 7.30 in swine feeds, USD 11.20 in layer feeds and USD 11.30 in broiler feeds.

Variation in the AID (or SID) amino acid content has the largest impact in swine feeds. Digestible phosphorus has the highest value in layer feeds. The effects of digestible energy and amino acids on the value of soybean meal are additive.

1.4 Shadow prices soybean meal by origin. Thailand

Table 9: Differences in value (USD/MT) of the different soybean meals caused by the chemical and nutritional differences among U.S. SBM, Brazilian SBM and Argentinean SBM, based on a Hi Pro SBM price of USD 495/MT for August 2018

	Swine			Layer			Broiler		
	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.	Argent. vs Brazil	U.S. vs Brazil	U.S. vs Arg.
Absolute differences in nutrient value (as table 1)									
Protein%	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2	-0.9	-0.7	+0.2
Energy cal	-40	+10	+50	-48	+20	+68	-39	+30	+69
Value (USD/Mt) differences									
Protein	-5.60	-4.60	1.30	-8.80	-6.90	2.00	-8.10	-6.40	1.80
Energy	-3.00	0.70	3.70	-6.70	2.80	9.40	-3.40	2.60	6.00
Dig. AA *	0.60	20.40	19.50	4.90	8.40	3.50	1.60	5.00	3.30
Total	-8.00	16.50	24.50	-10.60	4.30	14.90	-9.90	1.20	11.10

*Rest caused by differences in amino acid digestibility and mineral content (P). See Appendix

The shadow price of toasted soybeans (market price USD 530) is USD 473.10 in pig, USD 486.60 in layer and USD 508.90 in broiler feeds.

Hipro soybean meal is therefore the most attractive protein source especially in poultry feeds, next to maize DDGS.

Analyses of value differences (USD/Mt) of soybean meal of differing qualities

The value difference caused by each factor is given in table 9 where a comparison is made to Brazilian soybean meal for each species. This analysis is based on the shadow prices in Thailand (Hipro soybean meal USD 495) for August of the different qualities soybean meal. The results are in general applicable to all regions.

A difference of 0.9% crude protein adds or decreases USD 5.60/Mt to the value of Hipro soybean meal in swine feeds, 8.80 in layer feeds and 8.10 in broiler feeds.

Altogether the value differences due to protein content are larger in poultry than swine feeds. Differences in value due to differences in digestible energy content are largest in layer feeds and in digestible amino acid and phosphorus content in swine feeds. In conclusion next to the protein content. The digestible energy. Amino acid and phosphorus contribute significantly to the value of soybean meal.

Variation in nutrient values

The effect of variation in the nutrient value (4-5%) of soybean meal on the value (market price USD 495/Mt in Thailand for August 2018) is given in the following table.

Table 10: Price effect of variation in nutrient value

	Swine	Layer	Broiler
+/- 100 cal	7.30	13.80	8.80
+/- 4% dig AA	11.70	1.10	1.70
+/- 100 Cal and 4% dig AA	19.00	14.90	10.40
+/- 0.1 g/kg dig P	0.00	0.50	0.30

Variation in the energy content has the largest effect on the value of soybean meal in layer feeds and variation in the digestible amino acid content has the most value in swine feeds. A variation of +/- 100 kcal has an effect on the Hipro soybean meal value of USD 7.30 in swine, USD 13.80 in layer feeds and USD 8.80 in broiler feeds.

Variation in the AID (or SID) amino acid content has the largest impact in swine feeds. Digestible phosphorus has the highest value in layer feeds. The effects of digestible energy and amino acids on the value of soybean meal are additive.

Summary

In summary the higher economic and nutritional value of soybean meal from U.S. origin over soybean meal from Argentina or Brazil, at the same protein content, is caused by the (combined) higher amino acids and organic matter (= energy) digestibility. Differences in the (digestible) energy content contribute more to the added value than differences in digestible amino acid and phosphorus content.

Sincerely yours.

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Appendix 1: Nutrient values per species of the soybean meals by origin

Chemical composition (g/kg product)

Feedstuffs	CVB	Mateos Matrix		
	SFR	Argentina	Brazil	U.S.
Composition (g/kg)	46.8% CP	46% CP	46.9% CP	46.2% CP
Moisture	122.0	120.0	112.0	120.0
C.Protein	468.0	460.0	469.0	462.0
C.Fiber	40.0	36.0	54.0	38.0
Ash	64.0	67.0	62.0	67.0
C.Fat	22.0	16.0	19.0	15.0
Starch (Ewers)	40.0	25.0	25.0	25.0
Sugars	65.0	67.0	53.0	79.0
Calcium	2.80	3.30	3.00	4.60
Phosphorus	6.30	6.90	6.20	6.80
Potassium	22.3	22.5	21.3	21.1
Lysine	29.0	28.3	28.6	28.8
Meth+cyst	13.6	13.5	13.4	13.5
Tryptophan	6.1	6.3	6.3	6.4
Threonine	18.3	18.2	18.2	18.1
Isoleucine	21.5	20.8	21.2	20.8
Energy value				
NE pigs kcal	1945	1940	1980	1990
EV pigs (Dutch)	92.62	92.38	94.29	94.76
AME layer kcal	2227	2242	2290	2310
AME broiler kcal	1888	1901	1940	1970
Digestible nutrients				
Digestible P swine	2.50	2.70	2.40	2.70
Dig. P poultry	2.60	2.80	2.30	2.80
il.dig.Lys swine	25.8	24.0	24.6	25.9
Il.dig.Lys/100 g.Pr	5.51	5.22	5.25	5.61
il.dig.Meth swine	5.9	5.5	5.4	5.8
il.dig.M+C swine	11.6	10.9	11.1	11.6
il.dig.Tryp swine	5.2	5.2	5.2	5.5
il.dig.Thre swine	15.4	14.5	14.7	15.4
il.dig. Isol swine	18.7	17.5	18.1	18.5
dig.Lys poultry	25.5	24.0	24.7	26.2
dig.Lys/100 g.Prot	5.45	5.22	5.27	5.67
dig.Meth poultry	5.8	5.5	5.5	5.8
dig.M+C poultry	11.5	11.1	11.2	11.9
dig.Tryp poultry	5.4	5.4	5.4	5.5
dig.Thre poultry	15.6	14.9	15.2	15.9
dig.Isol poultry	18.9	18.1	18.7	18.8

Appendix 2: Feedstuff prices

Colombia

Feedstuff category	Feedstuffs	Price Peso/ USD per MT
Grains	Maize	683/ 239 USD MT
	Wheat	NA
	Rye	NA
	Barley	NA
	Triticale	NA
	Sorghum	NA
By products	wheat middlings	NA
	wheat bran	649/ 224 USD MT
	maize gluten 60% CP	2.065/ 712 USD MT
	maize gluten feed	647/ 223 USD MT
	beet pulp	1.845/ 636 USD MT
	glycerol 80%	NA
Protein rich	Soy beans toasted	1.450/ 500 USD MT
	Soybean meal Hipro 47% CP	1.367/ 471 USD MT
	Rapeseed meal 00 34-36% CP	NA
	Rapeseed expellers	NA
	Maize DDGS	892/ 307 USD MT
	Wheat DDGS	NA
	Peas	NA
	Sunflower 28/30% Profat	NA
	Sunflower 34% CP	1.159/ 399.80 USD MT
	Fish meal (CP? 56-59)	4.776/ 1.647 USD MT
	Lupins	NA
Fats and oils	Animal fat	1.940/ 669 USD MT
	Soy oil	NA
	Palm oil	2210/ 762 USD MT
	Palmoil fatty acids	NA
	Fatty acid mixtures	NA
Binders	Molasses (cane or beet)	450/ 155 USD MT
Fiber rich	Citrus pulp	NA
	Soy hulls	NA
	palmkernel meal	350/ 120.70 USD MT
	Alfalfa meal 16%	1.218/ 420 USD MT
Additives	L-Lysine HCl	4.023/ 1.387.70 USD MT
	DL-methionine	7.697/ 2.655 USD MT
	L-threonine	3.990/ 1.376 USD MT
	L-tryptophan	34.072/ 11.753 USD MT
	Salt	326/ 112.40 USD MT
	Limestone	120/ 43 USD MT
	Nutricalfos 17.9%P 32% Ca	1.544/ 533 USD MT

Peru

Feedstuff category	Feedstuffs	Price (USD per MT)
Grains	Maize	220
	Wheat	280 Ruso
	Rye	NA
	Barley	NA
	Triticale	NA
	Sorghum	240
By products	wheat middlings	NA
	wheat bran	NA
	maize gluten 60% CP	702
	maize gluten feed	NA
	beet pulp	NA
	glycerol 80%	NA
Protein rich	Soy beans toasted	420
	Soybean meal Hipro 47% CP	445
	Rapeseed meal 00 34-36% CP	NA
	Rapeseed expellers	NA
	Maize DDGS	315
	Wheat DDGS	NA
	Peas	NA
	Sunflower 28/30% Profat	NA
	Sunflower 34% CP	390 –Boliviana
	Fish meal (CP?)	1500 – Super Prime
	Lupins	NA
Fats and oils	Animal fat	705
	Soy oil	740
	Palm oil	660
	Palmoil fatty acids	565
	Fatty acid mixtures	565
Binders	Molasses (cane or beet)	NA
Fiber rich	Citrus pulp	NA
	Soy hulls	NA
	palmkernel meal	153
	Alfalfa meal 16%	NA
Additives	L-Lysine HCl	1.530
	DL-methionine	2.650
	L-threonine	1.800
	L-tryptophan	14.000
	Salt	130
	Limestone	70
	Monocalcium phosphate	570
	Dicalcium phosphate	520

The Philippines

Feedstuff category	Feedstuffs	Price USD MT
Grains	Maize	330-340
	Wheat	320-325
By products	Wheat pollard	280-290
	Wheat bran	180-190
	Rice bran	270-280
	Copra meal	220-230
Protein rich		
	US DHSBM	480-490
	Argentine SBM	460-470
	Brazillian SBM	N/A
	Extrd FFSBM	580-590
	DDGS	320-340
	Fish meal. 65%	1280-1290
	Fish meal 58%	940-960
Fats and oils	Animal fat	630-650
	Soy oil	820-850
	Palm oil	670-680
	Palmoil fatty acids	720-730
	Coconut oil	900-920
Binders	Molasses (cane or beet)	200-210
Fiber rich	Pollard	220-230
	Soy hulls	N/A
	Palm kernel meal	270-280
Additives	L-Lysine HCl	1700-1800
	DL-methionine	3200-3400
	L-threonine	3000-3300
	L-tryptophan	40.000-44.000
	Salt	60-70
	Limestone	80-90
	Monocalcium phosphate	500-560
	Dicalcium phosphate	400-450
	Phytase	750-800

Thailand

Feedstuff category	Feedstuffs	Price USD MT
Grains	Maize	250-270
	Wheat	250-260
By products	Wheat pollard	-
	Wheat bran	220-230
	Rice bran	240-250
	Copra meal	-
Protein rich		
	US DHSBM	490-500
	Argentine SBM	470-480
	Brazillian SBM	500-510
	Extrd FFSBM	520-540
	DDGS	290-300
	Fish meal. 65%	1.225-1.345
	Fish meal 58%	1.195-1.225
Fats and oils	Animal fat	595-895
	Soy oil	740-760
	Palm oil	610-620
	Palmoil fatty acids	610-620
	Coconut oil	1.120-1.130
Binders	Molasses (cane or beet)	145-155
Fiber rich	Pollard	
	Soy hulls	190-200
	Palm kernel meal	150-160
Additives	L-Lysine HCl	1.320-1.370
	DL-methionine	2.600-2.650
	L-threonine	1.320-1.350
	L-tryptophan	10.000-11.000
	Salt	85-95
	Limestone	20-30
	Monocalcium phosphate	540-550
	Dicalcium phosphate	415-425
	Phytase	-