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## Economics of Using Different Soybean Meal Types



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## Economics of Using Different Soybean Meal Types

Creswell and Swick (2008) reported significant difference in growth performance in male Ross 308 broilers given diets containing identical level of soybean meals from different sources. They attributed these performance differences to the differences in the nutrient contents of the soybean meal from different origin.

Can the differences in nutrient content justify the differences in price of the various soybean meals one has to pay in Malaysia?

To answer this question, energy (ME), digestible amino acids (DAA) and proximate assay values derived from NIR (by Adisseo) from samples of soybean meals from India, Argentina, US and Malaysia (Soon Soon) were compared. (Table 1).

**Table 1            Nutrient levels used for the soybean meals available in Malaysia**

	<b>Indian SBM</b>	<b>Argentine SBM</b>	<b>US SBM</b>	<b>SS SBM</b>
ME, Kcal/kg	2162	2340	2376	2550
Protein, %	46.0	46.5	47.5	47.5
Calcium, %	0.30	0.30	0.30	0.30
Available P, %	0.20	0.20	0.20	0.20
Sodium, %	0.02	0.02	0.02	0.02
Choline, ppm	2860	2860	2860	2860
Digest. Lysine, %	2.36	2.43	2.46	2.69
Digest. Methionine, %	0.55	0.57	0.56	0.59
Digest. M+C, %	1.03	1.12	1.13	1.18
Digest. Tryptophan, %	0.56	0.59	0.60	0.64
Digest. Threonine, %	1.56	1.64	1.61	1.75
Digest. Arginine, %	3.06	3.16	3.10	3.39
Digest. Isoleucine, %	1.90	1.92	1.92	2.09
Digest. Valine, %	2.00	2.03	2.02	2.20
Moisture, %	10.44	10.61	10.66	11.13
Protein, %	45.55	46.21	45.99	48.58
Fat, %	1.36	2.12	2.63	2.55
Crude fibre, %	6.05	3.75	3.94	2.28
Ash, %	8.04	6.81	6.22	5.54

*Note that the ME, digestible amino acids and proximate assay values in the above table were derived by NIRS from samples of these 4 soybean meals.*

**Table 2 Prices on August 26, 2008**

	<i>RM per kg</i>
L-Lysine	7.50
DL-Methionine	21.00
L-Threonine	8.00
L-Tryptophan	145.00

Because soybean meal is the single most important protein source in the present day mono-gastric livestock diets, only differences in digestible amino acids were considered in this exercise.

Since broilers fed diets using Soon Soon SBM resulted in best overall performance (Creswell & Swick, 2008), this SBM was used as a basis for comparison. The differences in digestible amino acids content of SBM from India, Argentina and USA compared to that of Soon Soon SBM were summarized in Table 3 and converted to per tonne basis in Table 4.

**Table 3 Difference in nutrient content compared with Soon Soon SBM**

	<b>India SBM</b>		<b>Argentina SBM</b>		<b>US SBM</b>		<b>SS SBM</b>	
		diff		diff		diff		diff
Dig. Lysine, %	2.36	-0.33	2.43	-0.26	2.46	-0.23	2.69	0.00
Dig. Methionine, %	0.55	-0.04	0.57	-0.02	0.56	-0.03	0.59	0.00
Dig. Threonine, %	1.56	-0.19	1.64	-0.11	1.61	-0.14	1.75	0.00
Dig. Tryptophan, %	0.56	-0.08	0.59	-0.05	0.60	-0.04	0.64	0.00

Table 3 shows that comparing to Soon Soon SBM, digestible lysine content of India SBM was lower by 0.33%, Argentina SBM lower by 0.26% and US SBM lower by 0.23%. Similarly, digestible methionine, digestible threonine and digestible tryptophan levels were lower in SBM from sources other than Soon Soon (Table 3).

**Table 4 Difference in nutrient content (per mt) compared with Soon Soon SBM**

	<b>India SBM</b>		<b>Argentina SBM</b>		<b>US SBM</b>		<b>SS SBM</b>	
		diff		Diff		diff		diff
Dig. Lysine, kg	23.6	-3.3	24.3	-2.6	24.6	-2.3	26.9	0.0
Dig. Methionine, kg	5.5	-0.4	5.7	-0.2	5.6	-0.3	5.9	0.0
Dig. Threonine, kg	15.6	-1.9	16.4	-1.1	16.1	-1.4	17.5	0.0
Dig. Tryptophan, kg	5.6	-0.8	5.9	-0.5	6.0	-0.4	6.4	0.0

Weight for weight basis, each tonne of Soon Soon SBM contained 2.3kg more digestible lysine than US SBM, 2,6kg more than Argentine SBM and 3.3kg more than Indian SBM. Similarly, digestible methionine, digestible threonine and digestible tryptophan contents were higher in Soon Soon SBM compared to those in SBM from India, Argentina and USA (Table 4).

**Table 5** Values of the differences in nutrient content (per mt) compared with Soon Soon SBM based on prices of synthetic amino acids in Table 2.

	India SBM		Argentina SBM		US SBM		SS SBM	
	diff	RM	diff	RM	diff	RM	diff	RM
Dig. Lysine, kg	-3.3	-24.75	-2.6	-19.50	-2.3	-17.25	0.0	0.00
Dig. Methionine, kg	-0.4	-8.40	-0.2	-4.20	-0.3	-6.30	0.0	0.00
Dig. Threonine, kg	-1.9	-15.20	-1.1	-8.80	-1.4	-11.20	0.0	0.00
Dig. Tryptophan, kg	-0.8	-116.00	-0.5	-72.50	-0.4	-58.00	0.0	0.00
Total		-164.35		-105.00		-92.75		0.00

To bring the quality levels of these soybean meals up to that of Soon Soon SBM, augmentation of synthetic amino acids or their analogues would be required to offset the amino acids shortfall. Using prices of amino acids summarized in Table 2, US SBM will require RM92.75 cost per tonne of augmentation, Argentine SBM RM105 per tonne and Indian SBM, RM164.35 per tonne to bring their digestible amino acids level to that of Soon Soon SBM (Table 5).

Lower nutrient levels were not just confined to digestible amino acids alone. Another critical nutrient, metabolizable energy (ME) levels were also lower in Indian SBM, Argentina SBM and US SBM by 388 kcal /kg (2162 vs 2550), 210 kcal/kg (2340 vs 2550) and 174 kcal/kg (2376 vs 2550), respectively, when compared to that in Soon Soon SBM (Table 1).

From the above, it can be concluded that it is justifiable to use high quality soybean meal even though the price was higher. Because of lower digestible amino acids and ME content, price of Indian SBM should be at least RM164.35 per tonne lower than that of Soon Soon SBM before it is worthwhile to consider using. Similarly, Argentina SBM should be RM105 and US SBM RM92.75 per tonne lower. Besides, other consideration like processing techniques which affect the availability of nutrients should also be

evaluated before decision to switch to cheaper products. Otherwise, performance may be affected.

#### References:

1. Creswell, D. and Swick, R.A., 2008. Soybean Meals are not all the same! 1. Effect of soybean meal type and specification on the performance of male broilers. Presented at Soybean Meal Quality Conference, 4 – 5 August, 2008, Bangkok.