

Amino Acids

Soybean is an excellent source of protein and therefore the most important source of dietary protein for animal feed in South Africa and also most of the world. Eight essential amino acids, necessary for human nutrition and which are not synthesized naturally in the body, are found in soybeans.

Ten samples (representing different regions as well as different classes on grades) were selected randomly for amino acid analysis.

The protein bound amino acids determinations were done by liquid chromatographic analysis using a Pico-Tag method (Methods on page 18). The analyses were done in duplicate and the average values reported. The working standard concentration is 1.25 $\mu\text{mol/ml}$ and each amino acid value is calculated to ng/injection (8 μl). Results are reported as g amino acid / 100g sample, on an “as is” basis.

The amino acid values are reported with the crude protein values which were calculated to 16% nitrogen by multiplying the nitrogen value by 6.25. These crude protein values are also reported on an “as is” basis for comparison purposes.

It is important to note that the amino acid analyses were done on the whole soybean samples and not on isolated soybean protein or heat processed soybean meal. It is well known that soybeans must be heat processed to destroy anti-nutritional factors and thereby improving the digestibility of all amino acids. Over-processing however will reduce the concentration and decrease the digestibility of the amino acids, most critically lysine and cysteine.

Table 4: Amino Acid and crude protein results for the 2011/2012 season

<i>Region</i>	<i>11</i>	<i>13</i>	<i>19</i>	<i>20</i>	<i>21</i>	<i>25</i>	<i>28</i>	<i>31</i>	<i>34</i>	<i>36</i>
<i>Grade</i>	<i>SB1</i>	<i>SB1</i>	<i>COSB</i>	<i>SB1</i>	<i>SB1</i>	<i>SB1</i>	<i>SB1</i>	<i>SB1</i>	<i>SB1</i>	<i>COSB</i>
Tryptophan, g/100g (as is)	0.43	0.43	0.43	0.44	0.37	0.40	0.42	0.36	0.41	0.42
Methionine, g/100g (as is)	0.50	0.50	0.49	0.49	0.41	0.50	0.47	0.48	0.49	0.48
Cysteic acid, g/100g (as is)	0.78	0.81	0.82	0.82	0.75	0.80	0.79	0.79	0.79	0.79
Aspartic acid, g/100g (as is)	3.84	3.92	3.83	4.05	3.35	3.89	4.00	3.80	3.93	4.11
Glutamic acid, g/100g (as is)	6.75	6.72	6.77	6.62	5.65	6.55	6.56	6.37	6.71	7.15
Serine, g/100g (as is)	2.04	2.04	1.96	2.04	1.66	1.95	2.00	1.90	1.96	2.07
Glycine, g/100g (as is)	1.65	1.66	1.58	1.67	1.41	1.54	1.61	1.51	1.59	1.64
Histidine, g/100g (as is)	1.13	1.17	1.07	1.07	0.94	1.03	1.07	1.01	1.09	1.13
Arginine, g/100g (as is)	2.64	2.63	2.50	2.60	2.14	2.52	2.61	2.42	2.62	2.67
Threonine, g/100g (as is)	1.47	1.45	1.46	1.49	1.34	1.46	1.47	1.46	1.49	1.51
Alanine, g/100g (as is)	1.59	1.62	1.56	1.62	1.44	1.54	1.60	1.54	1.58	1.63
Proline, g/100g (as is)	1.96	1.98	1.90	1.99	1.70	1.85	1.95	1.82	1.92	2.01
Tyrosine, g/100g (as is)	1.20	1.23	1.18	1.13	0.95	1.17	1.19	1.16	1.16	1.18
Valine, g/100g (as is)	1.79	1.84	1.76	1.75	1.52	1.67	1.70	1.66	1.68	1.71
Isoleucine, g/100g (as is)	1.52	1.54	1.47	1.54	1.29	1.46	1.48	1.46	1.49	1.59
Leucine, g/100g (as is)	2.68	2.67	2.67	2.75	2.35	2.59	2.55	2.61	2.58	2.78
Phenylalanine, g/100g (as is)	1.86	1.82	1.78	1.84	1.48	1.74	1.78	1.54	1.80	1.88
Lysine, g/100g (as is)	2.57	2.48	2.44	2.49	2.19	2.31	2.41	2.32	2.40	2.59
Crude protein, % (as is)	37.56	36.94	35.22	36.89	30.42	34.44	36.25	33.65	36.21	37.47
Number of samples	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>