


**Proteins Master Data Sheet**

* Bold type = Essential Amino Acids		Key function	Keratin	Spirulina	Hemp	Coconut	Oats	Wheat	Silk	Collagen	Egg white	Rice
Isoleuine	Most Hydrophobic		2.6	3.5	0.98	2.05	2.1	0.53			0.74	0.35
Valine		Deficiency is found in studies of people with hair loss.	5.8	4.3	1.28	3.32	2.5	4.1	2	2.6	0.98	0.51
Leucine		Deficiency can cause hair loss. Older adults may become deficient. This is an essential amino acid	5.8	5	1.72	4.76	2.9	0.9			1.08	0.71
Phenylalanine		Improves tensile strength	1.6	2.8	1.17	4.3	2.7	0.63			0.76	0.43
Cysteine		Sulfur-containing so forms disulphide bonds for hair strengthening.	17.8	0.7	0.41	1.62	8.6	1.8	0.1	0	0.29	0.1
Methionine		Sulfur derived for keratin manufacture. Also boosting hair strength	0.6	1.2	0.58	1.55	11.5	0.22			0.47	0.17
Alanine		People with hair loss have often been found deficient in this.	4.6	4.7	1.28	3.64	3.5	2.7	28.5	10.2	0.83	0.56
Glycine	Neutral		6.4	3.2	1.14	3.9	4.5	3.5	34.7	24.3	0.5	0.47
Threonine			6.8	3	0.88	2.76	2.7	0.42			0.58	0.34
Tryptophan		Linked to hair colouration and rises in keratinized hair.		20	0.2	1.38		0.51			0.2	0.09
Serine			11.7	3.3	1.27	4.11	11.3	5.7	15.4	4.1	0.92	0.48
Tyrosine	Hair colour and vitality. Affected by stress which is why stress can cause hair to turn white	2	3	0.86	2.1	6.6	2.9	0.6	0.3	0.46	0.33	
Histidine	Most Hydrophillic	Improves tensile strength	0.9	1	0.71	2.29	4	2.2	0.8	0.8	0.28	0.19
Proline			8.4	2.7	1.15	3.37	9	11.9	1.2	16	0.5	0.4
Arginine		Essential for hair growth	5.8	4.4	3.1	12.22	4	3.2	1.5	9.2	0.68	0.62
Aspartic Acid			4.9	6	2.78	8.64	3.6	3.1	4.7	6.7	1.23	0.86
Glutamic Acid			11.4	9.2	4.57	21.67	7.5	36.7	4.1	11.6	1.67	1.68
Lysine			2.7		3	3.34	5.4	0.37			0.74	0.31
Hydroxylysine					0		0	0	1			
Hydroxyproline					0		0	0	14.2			
<b>TOTAL</b>			<b>99.8</b>	<b>78</b>	<b>27.08</b>	<b>87.02</b>	<b>92.4</b>	<b>81.38</b>	<b>93.6</b>	<b>101</b>	<b>12.91</b>	<b>8.6</b>
% Hydrophobic			39	38	27.5	24	36.6	13.4	33	12.7	40	33.5
% Hydrophillic			34	40	56.5	60	36.4	70.6	13	44	40	46.5
% Neutral			27	23	16	16	27	16	54	28	20	20
Features			BENCHMARK	Very similar to natural hair but with a gentle rather than strong effect	Higher water retention than human hair	Higher water retention than human hair	Very similar to Keratin	High water retention. Double that of glycerin	Longer moisture retention than wheat.	Best for scalp conditioning, not so substantive to hair.	Very similar to human hair with regards to moisture retention but just very low efficacy	More water retentive than human hair but only very lightly
Benefit				Very similar to hair	Great for dry hair, building volume etc.	Great for dry hair, building volume etc.	Best vegan alternative for hair strengthening. Curl enhancing.	Great for dry hair, building volume etc.	High plasticity/ flexibility. Great for gentle relaxing of tight curls or for defuzzing	NA	Ultra-gentle treatment	Can be good in low humidity for extra dry hair with little chance of build-up
Caution				Quite highly coloured and with a base odour that can be covered.	Can make hair less flexible (elastic)	Can make hair less flexible (Elastic)	None	Can make hair less flexible (Elastic)	Not so great for holding curls and can flatten volume.	NA	Egg allergies	Not that effective as low overall protein quantity