

AMINOACID CONTENT OF FENUGREEK SEED FOR LIVESTOCK AND POULTRY

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Introduction

India, the spice bowl of the world with more than 50 varieties of spices being produced. The total production of spices in India is estimated at 5.8 million tonnes and it accounts for over 45 percent of the world spice trade by volume and value. Fenugreek, an important spice was produced to the tune of 1.279 lakh tonnes in the year 2010-11. Rajasthan accounts for 74% of the fenugreek seed produced in India (Anonymous, 2010a).

The active therapeutic constituents of fenugreek seeds are 4-hydroxy isoleucine (Hajimehdipoor *et al.*, 2008), lysine and L-tryptophan rich proteins, mucilaginous fibre (galactomannan) and other rare chemical constituents such as saponins, coumarin, fenugreekine, nicotinic acid, sapogenins, phytic acid, scopoletin and trigonelline, which are thought to account for many of its presumed therapeutic effects like inhibition of cholesterol absorption and lowering blood sugar level (Bukhari *et al.*, 2008).

Galactomannan in fenugreek has been identified to lower blood glucose, hence separation of galactomannan are undertaken at industrial levels (eg. M/s. E.I.D. Parry (India) Limited, Bio Products Division, Cuddalore, Tamilnadu, India) to produce anti-diabetic nutraceutical. Galactomannan are the major polysaccharide found in fenugreek seed and represent approximately 50% of the seed weight (Raghuram *et al.*, 1994). The remaining 50% of the material from fenugreek galactomannan extraction industry is available as galactomannan depleted fenugreek residue (GDFR).

*Received May 2, 2018 * Published June 2, 2018 * www.ijset.net*

Table 1 Amino acid composition of fenugreek seed, GDFR, maize and soya

Amino acids	Fenugreek seed				GDFR	Maize	Soya	Maize % CP basis	Soya % CP basis
	a*	b*	c**	d**	e**	f **	f **		
Arginine	3.69	8.0	1.96		3.20	0.38	3.14	0.04	1.39
Cystine			0.12		0.50	0.18	0.66	0.02	0.29
Glycine	4.78	9.5	1.20		3.17	0.33	1.9	0.03	0.84
Histidine	2.34	1.1	0.51		0.76	0.23	1.17	0.02	0.52
Isoleucine	4.65		1.30		2.14	0.29	1.96	0.03	0.87
Leucine	6.57	11.0	1.57		1.90	1.00	3.39	0.09	1.50
Lysine	5.78	8.0	1.4	2.3	2.15	0.26	2.69	0.03	1.19
Methionine	0.78		0.17		0.22	0.18	0.62	0.02	0.28
Phenylalanine	4.04	1.0	0.96		0.95	0.38	2.16	0.04	0.95
Threonine	3.57	5.0	0.81		1.01	0.29	1.72	0.03	0.76
Tryptophan	4.48				0.06	0.06	0.74	0.01	0.33
Tyrosine	2.30	3.0	0.70		0.77	0.30	1.91	0.03	0.84
Valine	6.13		0.94		1.21	0.40	2.07	0.04	0.91

a. Nabey and Damir (1990);
d. Mathur and Choudhry (2009);
* g/100 g protein

b. Leela and Shafeekh (2005);
e. Anonymous (2010b);
** g/100 g sample

c. Abaza (2007);
f. NRC (1994).

Amino Acids

The amino acid composition of fenugreek seed (FS) is presented in Table. The range of individual amino acid in FS are arginine (1.96 - 8.0%), cystine (0.12%), glycine (1.2 - 9.5%), histidine (0.51 - 2.34%), leucine (1.57 - 11.0%), isoleucine (1.3 - 4.65%), lysine (1.4 - 8%), methionine (0.17 - 0.78%), phenylalanine (0.96 - 4.04%), threonine (0.81 - 5.0%), tryptophan (4.48%), tyrosine (0.7 - 2.3%) and valine (0.94 - 6.13%).

Conclusion

The three major limiting amino acids namely lysine (2.15 vs 4.4), methionine (0.22 vs 0.48) and threonine (1.0 vs 0.1) were less in GDFR with mean reported values of FS. However when compared to maize the critical amino acids in both FS and GDFR were higher. Hence both fenugreek seed and GDFR has been used for poultry and livestock feed preparation.

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