

*Review Article*

## **NUTRITIONAL VALUE OF FENUGREEK SEED FOR LIVESTOCK AND POULTRY**

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### **Introduction**

Medicinal and aromatic plants have been used for many years in human nutrition as spices and medical additives in animals to increase dietary energy utilization, improve the performance efficiency and as a new source of protein.

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).

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).

### **NUTRIENT ANALYSES**

#### **Proximate Composition**

The proximate composition of fenugreek seed (FS) is presented in Table. The overall picture revealed that the crude protein content ranged from 12.9 to 34.1%, crude fibre from 4.7 to 14.8%, ether extract from 4.5 to 12%, total ash varied from 2.6 to 7.6% and nitrogen free extract from 36.8 to 57.5%.

As per the references the average crude protein, crude fibre, ether extract, total ash and nitrogen free extract content of FS were 26.78, 9.49, 7.21, 4.03 and 47.16% respectively.

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The crude protein (32.8%) and ether extract (9.1%) content of GDFR were higher and ash content was lower (1.3%) when compared with fenugreek seed. Compared with maize the crude protein, crude fibre and ether extract content of FS and GDFR were higher.

### **Fibre Fractions**

Ribes *et al.* (1984) reported that FS contained 28% NDF, 22% hemicellulose, 8.3% cellulose and 2.3% lignin and Kochhar *et al.* (2006) reported 35.1% NDF, 2.3% ADF and the hemicellulose content was 32.8% which was mainly the galactomannan component. Since fenugreek is used in human food the fibre fractionation is defined as soluble and insoluble fibre components. Naidu *et al.* (2011) reported fenugreek seed contained 30.6% soluble and 20.6% insoluble fibre.

The fibre fractions of maize are 21.5% NDF, 8.0% ADF and 1.6% lignin (NRC, 2001).

**Table 1 Proximate composition of fenugreek seed, GDFR and maize (% DM)**

S.No.	Crude protein	Crude fibre	Ether extract	Total ash	Nitrogen free extract	References
1.	31.6		6.3	4.9		Leela and Shafeekh (2005)
2.	25.8	6.3	6.5	3.3		Kochhar <i>et al.</i> (2006)
3.	23.1	10.2	8.2	3.4	45.9	Abaza (2007)
4.	30.4		6.9	3.0	53.0	El-Malky and Gouda (2007)
5.	28.4	9.3	7.1	3.2	47.4	El Nasri and El Tinay (2007)
6.	25.0		8.4	3.0	47.5	Sulieman <i>et al.</i> (2008)
7.	34.1		4.5	3.4		Mathur and Choudhry (2009)
8.	29.1	9.3	6.2	4.5	50.8	Mostafa <i>et al.</i> (2009)
9.	25.3	14.8	9.8	7.6	36.8	Ali (2009)
10.	26.2	7.2	5.8	3.0	44.1	Anonymous (2010a)
11.	24.6	5.8	7.9	3.9		Ziwar (2010)
12.	27.5		6.7	3.9		Naidu <i>et al.</i> (2011)
13.	28.0	4.7	12.0	2.6	45.0	Ali <i>et al.</i> (2012)
14.	12.9	13.1	4.5	4.2	57.5	Al-Jasass and Al-Jasser (2012)
15.	28.6	14	6.1	4.7	40.7	Elmnar <i>et al.</i> (2012)
16.	27.9	9.8	8.4	5.9	50.1	Mahmoud <i>et al.</i> (2012)
GDFR*	32.8		9.1	1.3		Anonymous (2010b)
Maize	8.5	2.2	3.8	1.7	83.80	NRC (1994)

\*GDFR – Galactomannan depleted fenugreek residue

## Conclusion

The protein content of fenugreek seed cultivars from Canada, namely Amber, F-70, F-86, L-3314 and Indian line were 31.6, 28.7, 30.1, 31.6 and 26%, respectively (Acharya *et al.*, 2006). Fenugreek seed contained a range between 5.5% and 7.5% fat for different varieties of fenugreek seeds from different locations of the Mediterranean area (Baccou *et al.*, 1978).

The variation in nutritive value of fenugreek seed is due to different genotypic varieties and growing from different locations.

As per the review it can be concluded that both fenugreek seed and GDFR have high protein, fat and ether extract content. Hence it has been used in livestock and poultry feed preparation.

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