

Physico-chemical Characteristics and Chemical Composition of Khesari Seeds (*Lathyrus sativus*)

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INTRODUCTION

Utilization of pulses constitutes a primary source of proteins, adds delicacy and variety to a well planned course of meal. These pulses commonly called as *Dal* vary in their qualitative composition. The pulses are completely digested and absorbed if made into flour, but the usual practice is to eat pulses in the form of dals (split pulses). Among these pulses, khesari (*Lathyrus sativus*) is one of the traditional pulses, contains the highest amount of protein next to soybean (Gupta, 1990). Khesari (*L. sativus*) requires little water and is sown with wheat as a para-crop in the winter so as to guard against drought. It is cheap and consumed by the labourers of the lower economic group. Among these people, Khesari usually contributes about 40 percent of the diet but during drought and famine the consumption increases 95-100 percent (Antia, 1989).

With this consideration in mind, the present investigation with local variety of khesari seeds (*Lathyrus sativus*) was undertaken with the following objectives:

1. To study the physical characteristics of khesari seeds (*L. Sativus*)
2. To study the effect of treatments on proximate composition.

MATERIAL AND METHODS

The seeds of khesari (*L. sativus*) were procured from the local farmers, cleaned and packed in polyethylene bags after drying. In order to evaluate the nutritional quality of the khesari seeds major thrust was given to the few parameters like protein, fat, ash, fiber, total soluble sugars, nitrogen free extract etc. Because of the presence of some anti-nutritional factors in khesari seeds

some treatments were also given.

1. *Soaking*: Khesari seeds were soaked overnight in water.
2. *Autoclaving*: Khesari seeds were autoclaved for one hour at 0.7 kg cm² pressure. Physical parameters like size of seeds, weight of seeds, seeds volume and water absorption capacity were also studied. For chemical analysis some parameters like protein, ether extract, ash, crude fibre, nitrogen free extract, calorific value, total soluble sugars etc. were taken into consideration (A.O.A.C., 1990)

RESULTS AND DISCUSSION

The length and width of khesari seeds were found to be 5.77 and 4.69 mm. The weight estimated on the basis of 100 count of khesari was 6.10 g, whereas volume was 0.90 cm³ and water absorption capacity was 1.75 mm³.

Khesari seeds raw, soaked and autoclaved were found to contain moisture contents as 11.64, 13.21, and 12.7 percent, respectively.

Khesari seeds contained 26.25 percent protein, the values being very close to 28.2 as reported by Gopalan et al. (1971). Local variety of khesari seeds showed lesser protein contents as compared to the protein contents reported by Shobhana et al. (1976) as 28.0 to 31.2 percent, Hussain and Khatun (1987) as 30.0 percent and Valentine et al. (1994) as 32.49 + 13.40 g per kg which could be due to the genetic nature, harvesting practices, type of variety, nature of soil etc. of khesari seeds.

In the present study, protein contents of soaked and autoclaved khesari seeds were 23.32 and 18.95 percent, respectively, which were comparatively less than the raw khesari seeds which may be due to the water soluble proteins present in

Table1: Physical characteristics of khesari seeds (*L. sativus*)

Variety	Size(mm)		Weight per 100 seeds(g)	Volume(cm ³)	Water absorption capacity(cm ³)
	Length	Width			
<i>L. sativus</i>	5.77	4.69	6.10	0.90	1.75

Table 2: Proximate composition of khesari (*L. sativus*)

Parameters (%)	Raw seeds	Soaked seeds	Autoclaved seeds	CD (5%)
Moisture	11.64	13.21	12.75	0.09
Protein	26.25	23.32	18.95	0.47
Ash	3.39	2.88	1.87	0.03
Ether extract	1.86	2.03	0.03	0.06
Fibre	7.23	7.08	6.79	0.05
Nitrogenfree extract	49.63	53.68	60.32	0.10
Energy(Kcal)	319.00	323.00	327.00	1.36
Total soluble sugars	4.34	4.12	3.17	0.06

these seeds, as stated by Jha (1988). The percentage of ash contents in raw khesari seeds was 3.39 followed by 2.88 and 1.87 in soaked and autoclaved seeds, respectively. As far as the ash content was concerned in khesari seeds, the values (3.39) were very close to the ash content (3.00g per 100g) reported by Hartman et al. (1974). Fat content was observed as 1.86 percent in khesari seeds, whereas higher values (5.0 to 5.5percent) were described by Shobhana et al. (1976) but higher (0.6g/100g) than the fat content as shown by Hartman et al. (1974), whereas fat contents in soaked and autoclaved khesari seeds were observed as 1.84 and 2.03 percent, respectively. It is evident from the Table 2 that untreated khesari seeds had 7.23 percent crude fibre contents whereas soaked and autoclaved seeds had 7.08 and 6.79 percent crude fibre contents, respectively, difference in autoclaved samples could be due to the effect of heat on the samples. Nitrogen free extract includes soluble sugar and carbohydrates. It is also considered as a rough index for the estimation of carbohydrates. The extents of nitrogen free extract/ soluble carbohydrates generally depends upon the presence of various important nutrients like crude protein, fat, ash, crude fibre, etc. and subtracting all these from one hundred. Nitrogen free extract was 49.63 percent for raw khesari samples and increased to 53.68 and 60.32 percent in soaked and autoclaved samples, respectively. The nitrogen free extract in khesari seeds differed greatly which could be due to some soluble nutrients which leached out after seed treatments (Gopalan et al.,1971). The nitrogen free extract in khesari seeds was lesser as compared to 58.20g per100g as reported by Hartman (1974), but was within the range reported

by Shobhana et al. (1974). The carbohydrate present in khesari was 55.9g per 100g (Swaminathan, 1990) which was less in the local variety of khesari. The total calorie content in untreated, soaked and autoclaved khesari was 319, 323 and 327 Kcal per 100g, respectively. Gopalan et al.(1971) stated that khesari had calorific value of 345 kcal per 100 g in edible portion where as Swaminathan (1990) had reported that 342 Kcal per 100 g are provided by *Lathyrus* pea which were very close to the calories recorded from the local variety of khesari. In the present study khesari had 4.34 percent total soluble sugars where as soaked and autoclaved had 4.12 and 3.17 percent total soluble sugar, respectively, which were statistically different at 5 percent level of significance. The difference may be due to the water soluble sugars, which leached out during the time of soaking and autoclaving of the samples (Jha, 1988).

CONCLUSION

It is concluded from the study that Khesari is a good source of protein, crude fibre and energy when consumed in limited amount, whereas soaking and autoclaving showed the leaching effect on protein contents, ash contents, crude fibre contents and total soluble sugars

KEY WORDS Pulses. Nutrients. Anti-nutritional Factors. Socio-economic Groups.

ABSTRACT In the present investigation the Khesari (*Lathyrus sativus*) was analysed for physical and chemical characteristics. The length, width, weight/100g, volume and water absorption capacity of the Khesari seeds was found to be 5.77mm, 4.69mm, 6.10g, 0.90cm³ and 1.75cm³, respectively. The raw, soaked and autoclaved Khesari seed samples were analysed for proximate composition. The moisture, protein, ash, ether extract, fibre, nitrogen free extract, total soluble sugars and energy were found to be 11.64, 26.25, 3.39, 1.86, 7.23, 49.63, 4.34g/100g and 319Kcal/100g, respectively. A significant decrease in, protein, ash, fibre and total soluble sugars was observed after soaking and autoclaving and this decrease might be due to the leaching effect of these nutrients.

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