

# Organoleptic and Nutritional Quality of Ready to Eat Products of Sesame Sold in Markets of Jaipur City

Mukta Agrawal<sup>1</sup>, Kailash Agrawal<sup>2</sup>, Priyanka Nagar<sup>3</sup>

<sup>1</sup>Department of Home Science, University of Rajasthan, Jaipur 302 004, India

<sup>2</sup>Department of Botany, University of Rajasthan, Jaipur 302 004, India

<sup>3</sup>Department of Home University of Rajasthan, Jaipur 302 004, India

**Abstract:** *Sesame being an important commercial oilseed crop is consumed highly during winter season. It is rich in energy, fat, protein, calcium and iron. Many ready to eat preparations of sesame both savoury and sweet are available in markets. Various ready to eat sweet preparations of sesame viz. revadi, gajak and tilpatti are consumed by large number of people in Rajasthan. They are eaten as such with no further cooking. Thus to study the overall quality of sweet ready to eat preparations of sesame such as “gajak”, “revadi” and “tilpatti” available in markets of Jaipur city, present investigation was undertaken. Samples were collected from departmental stores, small shops and vendors located in various areas of Jaipur city. To analyze organoleptic quality the composite test score method was used. Nutritional quality was assessed by estimating moisture, crude protein, total fat, ash, crude fibre, carbohydrate, calcium and iron by using standard methods of AOAC. The organoleptic quality of all the products sold at departmental stores was found best followed by small shops and vendors. Results of nutritional quality revealed that samples collected from departmental stores had higher percentage of protein, fat, calcium and iron as compared to small shops and vendors.*

**Keywords:** Sesame, organoleptic, nutritional, quality

## 1. Introduction

Sesame is an oilseed crop of North India[1]. Gingelly seeds, niger seeds, til or sesame are the various names used to designate this protein and calcium rich oilseed crop. India ranks first in the production of sesame in the world. Rajasthan is an important state accounting for the major production of sesame. It is consumed as such in many food preparations and also used in preparing many ready to eat preparations both savory and sweet. In Rajasthan mostly its sweet preparations like revadi, gajak, laddu, tilpatti etc. are commonly prepared and consumed. These products are sold at various categories of shops like vendors, big shops, departmental stores and small shops. These products are prepared majorly by small scale producers and very few big producers in Jaipur. Sugar or jaggery is used to sweeten the sesame products. These make the products hygroscopic. If the products are not stored in packed form or kept in covered containers, the texture changes and ultimately reduce the acceptability.

It was observed that vendors keep gajak, revadi and tilpatti in open tin boxes, glass boxes or large polybags. This when consumed by individual serve as medium of contamination and render its harmful effects on human body.

Therefore the present study was conducted to assess the quality of ready to eat products of sesame seeds like ‘gajak, revadi, and tilpatti’ available in markets of Jaipur.

## 2. Methodology

The study was conducted for the quality assessment of ready to eat products of sesame. One hundred gram of sample of

gajak, revadi and tilpatti made up of jaggery were collected from different shops situated in different markets of Jaipur. A total of 80 samples were collected from departmental stores, small shops and vendors (who are selling the products on push carts at a fixed place on roadside) located in various areas of Jaipur city. Collected samples of gajak, revadi and tilpatti were assessed for their organoleptic quality and nutritional quality. For the evaluation of the quality of ready to eat products of sesame, a panel of 10 judges in the age group of 20-40 years was selected using threshold method and was trained using triangle test and composite score was used to assess sensory quality of selected products. (Jellineck, 1985)[2].

They were given three coded samples. Composite test score was used for comparison and overall quality grading by a trained panel following the weighted score scheme quality attributes prepared for each product type. A weighted rating scale for quality attributes based on their relative importance contributing to the overall quality of ready to eat products of sesame was provided. The panelists were presented with three samples (each of gajak, revadi and tilpatti) at a time in different sessions. They were asked to evaluate each sample and to rate individual quality attributes. The quality attributes selected for the ready to eat products of sesame were general appearance of the ready to eat products i.e. color, appearance and shape, textural properties characterized by brittleness, crispness, soggy, taste, flavour acceptability of lingering taste in the mouth or mouth feel. The panelists were asked to give scores in every attribute out of five.

The nutritional quality of ready to eat preparations of sesame samples were analyzed for moisture, ash content, total fat,

crude fiber, crude protein, carbohydrates, calcium and iron using standard methods given by AOAC (1995)[3].

The data were statistically analyzed. The mean, standard deviation and standard error values were calculated for sensory scores and nutritional quality of the product.

### 3. Results

#### 1. Organoleptic Quality

**Table 1:** Organoleptic quality of gajak, revadi and tilpatti (jaggery) samples collected from various shops of Jaipur city.

Organoleptic Quality	Gajak			Revadi			Tilpatti		
	Departmental store	Small shops	Vendors	Departmental store	Small shops	Vendors	Departmental store	Small shops	Vendors
General appearance	3.7±0.05	2.4±0.04	1.81±0.06	3.95±0.05	2.25±0.1	2.02±0.03	3.84±0.05	2.2±0.1	1.57±0.10
Crispness	3.85±0.15	2.58±0.16	1.80±0.11	3.84±0.05	2.58±0.05	1.32±0.01	3.4±0.01	1.65±0.05	1.32±0.08
Taste	3.62±0.35	2.20±0.12	1.67±0.02	4.1±0.05	2.85±0.05	1.53±0.02	3.65±0.35	1.72±0.1	1.67±0.08
Flavor	4.1±0.1	1.69±0.46	1.36±0.06	3.65±0.05	2.25±0.1	1.80±0.04	3.95±0.25	2.05±0.15	1.50±0.1
After taste	3.95±0.05	2.84±0.12	1.20±0.31	3.95±0.05	2.17±0.02	1.36±0.02	3.8±0.4	2.35±0.05	1.42±0.08
<b>Overall acceptability</b>	4.15±0.30	2.65±0.05	1.50±0.23	4.15±0.05	2.38±0.03	1.20±0.04	3.85±0.35	2.25±0.05	1.45±0.05

**Gajak:** The scores for overall acceptability of the gajak samples collected ranged from 1.50±0.23 to 4.15±0.30. The mean scores of gajak samples were 4.15±0.30, 2.65± 0.05 and 1.50±0.23 for departmental store, small shops and vendors. The organoleptic quality of gajak made with jaggery sold by departmental stores scored highest followed by small shops and vendors.

**Revadi:** The scores for overall acceptability of the revadi samples collected ranged from 1.20±0.04 to 4.15±0.05. The mean scores of revadi samples were 4.15±0.05, 2.38± 0.03 and 1.20±0.04 for departmental store, small shops and vendors. The organoleptic quality of revadi made with

jaggery sold by departmental stores scored highest followed by small shops and vendors.

**Tilpatti:** The scores for overall acceptability of the tilpatti samples collected from various areas of Jaipur city ranged from 1.45±0.05 to 3.95±0.05. The mean scores of tilpatti samples were 3.85±0.35, 2.25± 0.05 and 1.45±0.05 for departmental store, small shops and vendors. The organoleptic quality of tilpatti made with jaggery sold by departmental stores scored highest followed by small shops and vendors.

#### 2. Nutritional Composition

**Table 2:** Average Nutritional Composition of gajak, revadi and tilpatti (jaggery) samples collected from various shops of Jaipur city.

Nutritional Quality	Gajak			Revadi			Tilpatti		
	Departmental store	Small shops	Vendors	Departmental store	Small shops	Vendors	Departmental store	Small shops	Vendors
Moisture (g)	4.11±0.01	2.98±0.05	1.95±0.19	3.77±0.01	3.60±0.53	2.83±0.12	3.96±0.69	2.80±0.30	1.99±0.10
Protein (g)	16.01±0.01	13.48±0.16	11.47±0.38	16.86±0.02	14.98±0.01	12.42±0.99	16.18±0.02	11.91±0.63	11.07±0.40
Fat (g)	36.13±0.01	32.43±1.11	30.44±0.70	37.27±0.01	33.68±0.63	29.78±1.17	37.06±0.91	32.09±1.0	29.61±0.19
Ash (g)	4.37±0.02	3.04±0.10	2.12±0.33	2.62±0.01	2.39±0.29	2.23±0.20	2.96±0.09	2.13±0.10	2.09±0.16
Fibre (g)	2.27±0.01	2.13±0.07	1.89±0.34	1.74±0.02	2.20±0.23	2.46±0.20	2.18±0.02	1.83±0.02	1.39±0.08
Calcium (mg)	1311±0.01	1049.16±72.36	1010.33±34.13	1195±3	972.5±8.64	985.33±68.91	1034.25±14.28	989±7.58	970.25±12.90
Iron (mg)	7.25±0.0	6.81±0.07	5.11±0.11	7.11±0.01	6.09±0.12	5.42±0.12	6.17±0.14	5.51±0.09	4.31±0.11
Carbohydrate (g)	39.15±2.09	45.82±1.04	52.10±1.53	37.73±0.01	43.25±1.11	50.27±2.11	37.64±1.67	49.20±0.76	53.83±0.45

**Table 2.1:** Average Nutritional Composition of gajak, revadi and tilpatti (jaggery) samples collected from various shops of Jaipur city

Nutritional Quality	Gajak	Revadi	Tilpatti
Moisture (g)	3.01±0.08	3.4±0.22	2.91±0.36
Crude Protein (g)	13.65±0.18	14.75±0.34	13.05±0.35
Total Fat (g)	33.0±0.60	33.57±0.60	32.92±0.7
Ash (g)	3.17±0.15	2.41±0.16	2.39±0.11
Crude Fibre (g)	2.09±0.14	2.13±0.15	1.8±0.12
Calcium (mg)	1123.49±35.5	1050.94±26.85	997.83±11.58
Iron (mg)	6.39±0.0	6.20±0.08	5.33±0.11
Carbohydrate (g)	45.69±1.55	43.75±1.07	46.89±0.96

**Table 2.2:** Caloric value of gajak, revadi and tilpatti (jaggery) samples collected from various shops of Jaipur city

Nutritional Quality	Gajak	Revadi	Tilpatti
Protein	54.6	59	52.2
Fat	297	302.13	296.28
Carbohydrate	182.7	175	187.56
<b>Total Energy(Kcal/100g)</b>	<b>534.3</b>	<b>536.13</b>	<b>536.04</b>

**Gajak:** The mean moisture content of gajak samples was 3.01±0.08. The mean protein, total fat, ash, crude fibre, and carbohydrate were 13.65±0.18g, 33.0±0.60g, 3.17±0.15g, 2.09±0.14g and 45.69±1.55g per 100g respectively. The calcium content of gajak was 1123.49±35.5mg/100g and mean iron content was 6.39mg/100g.

**Revadi:** The mean moisture content of revadi samples was  $3.42 \pm 0.22$ . The mean protein, total fat, ash, crude fibre, and carbohydrate were  $14.75 \pm 0.34$ g,  $33.57 \pm 0.60$ g,  $2.41 \pm 0.16$ g,  $2.13 \pm 0.15$ g and  $43.75 \pm 1.07$ g per 100g respectively. The calcium content of revadi was  $1050.94 \pm 26.85$ mg/100g and mean iron content was 6.20mg/100g.

**Tilpatti:** The mean moisture content of tilpatti samples was  $2.91 \pm 0.36$ . The mean protein, total fat, ash, crude fibre, and carbohydrate were  $13.05 \pm 0.35$ g,  $32.92 \pm 0.7$ g,  $2.39 \pm 0.11$ g,  $1.8 \pm 0.12$ g and  $46.89 \pm 0.96$ g per 100g respectively. The calcium content of revadi was  $997.83 \pm 11.58$ /100g and mean iron content was 5.33mg/100g.

#### 4. Discussion

The organoleptic quality of all the products sold at departmental stores was found best followed by small shops and vendors. The products sold at departmental stores have good storage conditions and are packed finely.

All the three preparations are rich in calories, protein, fat, calcium and iron content. These products are available in affordable cost. The nutritional composition of departmental stores found best followed by small shops and vendors. The nutritional value depends upon the amount of sesame mixed with the jaggery to make gajak, revadi and tilpatti. If proportion of ingredients varies ultimately the carbohydrate, iron, protein, calcium etc. also varies. Small scale producers use higher amounts of jaggery and lesser amount of sesame which increases the carbohydrate content while decrease the other important nutrients in these products.

The organoleptic as well as nutritional quality is also affected by the storage conditions. The vendors store these products in open containers like tin boxes, glass box or big trays. Jaggery may absorb or loose moisture depending upon the environmental humidity. When there is loss of moisture there may be concentration of nutrients. Further these open foods are mostly exposed to environmental pollution handling. Most of the time, the open foods sold by vendors and small shops are exposed to dust and soot from the atmosphere. The handlers have poor personal and environmental hygiene thus contaminate the foods.

Overall the methods of preparation of gajak, revadi and tilpatti by small scale producers, in present study were found are very unhygienic, crude and are prone to contamination at every step of preparation.

Thus, these ready to eat foods are to be produced under strict hygienic conditions, free from contamination, processed without much loss of nutritive value, sanitarly packaged and marketed with suitable labeling requirements.

Due to poor environmental, poor storage conditions and the poor nutritional quality of the raw ingredients used leads to microbial deterioration especially fungi [4]. Many crop pathogenic as well as saprophytic fungi adversely affect the nutritional quality of food products. They reduce the oil content, fibre content, insoluble carbohydrate such as starch and sometimes protein content (Agrawal *et al*, 2001) [5].

#### 5. Conclusion

The ready to eat products of sesame are rich in protein, carbohydrate, calcium and iron. The organoleptic as well as nutritional quality of all the products was satisfactory. But the products sold at departmental stores have superior quality as compared to small shops and vendors.

It was observed that there may be variations in the amounts of sesame used in making these products. Therefore, standardized recipes must be followed by producers. These ready to eat products should be packed in one portion size or in small portions to maintain quality.

#### References

- [1] <https://en.wikipedia.org/wiki/Sesame>
- [2] Jellineck, G.1985. Sensory Evaluation of food, theory and practices, Elis Horward International Publisher in Science and Technology, Chichester(England)
- [3] A.O.A.C. Official methods of analysis 1995(Ed.) Hornity, W. Washington, Association of Official Analytical Chemists, Washington D.C.
- [4] M. Agrawal, R. Jain, K. Agrawal "Microbial Quality of Ready to Eat Products of Sesame" Journal of Phytological Research, 2010,23(2):357-360
- [5] M. Agrawal, S. Agrawal, J. Sharma, K. Agrawal, 2001, Biodeterioration of oil seeds due to fungi. In: Seed Technology and Seed Pathology. (Ed.) T. Singh, and K. Agrawal (Eds), Pointer Publishers, Jaipur: 116-130