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# Awareness of women regarding nutrients of natural sweeteners in Punjab

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### Abstract
The study was conducted to know awareness level of urban and rural women regarding nutrients of selected natural sweeteners. Four natural sweeteners i.e. *Jaggery, Shakkar*, Honey and Stevia were selected for study. The study was conducted on 100 urban and 100 rural women in four districts of Punjab. Data were collected by using interview schedule. Study findings revealed that ninety percent of rural and urban respondents were not aware about stevia. Highest percentage of rural as well as urban respondents had low level of awareness regarding all nutrients of selected natural sweeteners and their nutritional value. So it is suggested that the Professionals who are involved in promotion of organic farming should create awareness among general public.

**Keywords:** Awareness, natural sweeteners, jaggery, shakkar, honey, stevia

## 1. Introduction
Nutritive and non-nutritive sweeteners are two different types of sweeteners. Artificial sweeteners and natural non-caloric sweeteners are included in the category of non-nutritive sweeteners (NSSs) (Grembecka 2015) [4]. These days there has been a huge demand for natural or calorie-free sweeteners, as the number of overweight and diabetic people has increased globally. Natural sweetener is chosen by people over white sugar for the production of several sweet foods because it has special qualities (FAO 2001) [3]. Proteins, minerals and vitamins are found in *jaggery*. Additionally, it is a powerful source of iron and contains more iron and copper than refined sugar. Honey is a complex substance that includes a variety of substances besides carbs, including organic acids, proteins, amino acids, minerals, polyphenols, vitamins, and fragrance compounds. Having 64 calories per tablespoon, honey is a natural source of easily accessible carbohydrates (FAO 2001) [3]. Keeping the above facts in mind, the study was undertaken with the following objectives:
1. To ascertain the level of awareness of women regarding the nutrients and nutritive value of natural sweeteners.
2. To compare level of awareness between rural and urban people.
3. To study the relationship and association of socio-personal and family profile of the respondents with their level of awareness regarding nutrients of natural sweeteners.

## 2. Materials and Methods
The study was conducted in three socio-cultural zones of Punjab. Total four districts of Punjab were included in study. Further one urban locality under control of Municipal Corporation and one village for purposively selected from each selected district. Total eight locations, four each from urban and rural areas were selected for the study. The 200 respondents comprised sample of study by selecting 100 each from urban and rural area. Four natural sweeteners i.e. *Jaggery, Shakkar*, Honey, Stevia were selected for study. Level of awareness was operationalised as awareness of women regarding the benefits of selected four natural sweeteners. The response was recorded on three point continuum i.e. fully aware, somewhat aware and not aware and accordingly two, one and zero scoring was assigned to calculate the awareness scores of the respondents. The awareness scores so obtained by the respondents were categorized into low, medium and high categories. Data were collected from the respondents with the help of interview schedule. The data were analyzed by using Percentage, Mean score, t-test, Correlation analysis, Chi-square test.

## 3. Results and Discussion

### 3.1 Level of awareness regarding nutrients of selected natural sweeteners

Data in Table 1 depicted that the mean scores of awareness regarding nutrients of *jaggery/shakkar* was highest for iron (0.23) followed by magnesium (0.04) and fat (0.02). In case of nutrients awareness, Honey had highest mean score (0.11) was obtained regarding fat followed by carbohydrates (0.03). In case of stevia, respondents were not aware about its nutrients.

Average means score value for urban and rural was same for awareness regarding nutrients of *jaggery/shakkar*. Statistical analysis has shown that there was non-significant relationship between urban and rural respondents with respect to nutrients of *jaggery/shakkar*. In case of honey average means score (0.02) of rural respondents were more than urban respondents (0.01). But non-significant relationship between urban and rural respondents was seen with respect to nutrients of honey may be due to their education.

Data in Table 2 revealed that 99 percent of respondents had low level of awareness regarding nutrients of *jaggery, shakkar* and honey. Overall level of awareness regarding nutrients of selected natural sweeteners of rural as well as urban respondents had low level.

**Table 1:** Mean awareness score of the respondents regarding different nutrients and nutritive values of natural sweeteners, n = 200, $n_1$ = 100, $n_2$ = 100

| Name of the Nutrients | Awareness level | | | t value | Nutritive Value | Awareness level | | |
|---|---|---|---|---|---|---|---|---|
| | Urban ($n_1$) | Rural ($n_2$) | Total (n) | | | Urban ($n_1$) | Rural ($n_2$) | Total (n) |
| | Mean Score | Mean Score | Mean Score | | | Mean Score | Mean Score | Mean Score |
| Jaggery/*Shakkar* | | | | | | | | |
| Calories | 0.02 | 0.00 | 0.01 | -1.00$^{NS}$ | 383 kcal | - | - | - |
| Sucrose | 0.00 | 0.00 | 0.00 | N.A | 65-85 gm | - | - | - |
| Fructose and Glucose | 0.02 | 0.00 | 0.01 | -1.00$^{NS}$ | 10-15 gm | - | - | - |
| Iron | 0.24 | 0.22 | 0.23 | N.A | 11 mg | - | - | - |
| Magnesium | 0.04 | 0.04 | 0.04 | 0.00$^{NS}$ | 70-90 mg | - | - | - |
| Potassium | 0.00 | 0.02 | 0.01 | 1.00$^{NS}$ | 1050 mg | - | - | - |
| Fat | 0.02 | 0.02 | 0.02 | 0.00$^{NS}$ | 0 g | - | - | - |
| Average Mean | 0.04 | 0.04 | 0.04 | | | | | |
| Honey | | | | | | | | |
| Calories | 0.00 | 0.00 | 0.00 | N.A | 288 kcal | - | - | - |
| Potassium | 0.00 | 0.00 | 0.00 | N.A | 52 gm | - | - | - |
| Carbohydrate | 0.00 | 0.06 | 0.03 | 1.750$^{NS}$ | 76.4 gm | - | - | - |
| Fructose | 0.00 | 0.00 | 0.00 | N.A | 41.8 gm | - | - | - |
| Glucose | 0.00 | 0.00 | 0.00 | N.A | 34.6 gm | - | - | - |
| Fat | 0.10 | 0.12 | 0.11 | 0.309$^{NS}$ | 0 g | - | - | - |
| Average Mean | 0.01 | 0.02 | 0.02 | | | | - | - |
| Stevia | | | | | | | | |
| Calories | 0.00 | 0.00 | 0.00 | N.A | 0 kcal | - | - | - |
| Fat | 0.00 | 0.00 | 0.00 | N.A | 0 g | - | - | - |
| Sodium | 0.00 | 0.00 | 0.00 | N.A | 0 mg | - | - | - |
| Carbohydrates | 0.00 | 0.00 | 0.00 | N.A | 0 g | - | - | - |
| Fiber | 0.00 | 0.00 | 0.00 | N.A | 0 g | - | - | - |
| Protein | 0.00 | 0.00 | 0.00 | N.A | 0 g | - | - | - |
| Glycosides | 0.00 | 0.00 | 0.00 | N.A | 0 g | - | - | - |
| Average Mean | 0.00 | 0.00 | 0.00 | | | | | |
| * Score Range (0-2) | | | | | | | | |

\* Significant at 5% level, N.A – Not Applicable

**Table 2:** Awareness level of the respondents regarding different nutrients of natural sweeteners, n = 200. $n_1$ = 100, $n_2$ = 100

| Category | Urban $n_1$ (%) | Rural $n_2$ (%) | Total n f (%) |
|---|---|---|---|
| Jaggery/*Shakkar* | | | |
| Low (0-4) | 99.00 | 99.00 | 198 (99.00) |
| Medium (5-9) | 1.00 | 1.00 | 2 (1.00) |
| High (10-14) | - | - | - |
| Honey | | | |
| Low (0-4) | 100 | 98.00 | 198 (99.00) |
| Medium (5-8) | - | 2.00 | 2 (1.00) |
| High (9-12) | - | - | - |
| Stevia | | | |
| Low (0-4) | 100 | 100 | 200 (100) |
| Medium (5-9) | - | - | - |
| High (10-14) | - | - | - |
| Overall | | | |
| Low (0-13) | 100 | 100 | 200 (100) |
| Medium(14-27) | - | - | - |
| High (28-40) | - | - | - |

### 3.2 Relationship of socio-personal profile of the respondents with their level of awareness regarding nutrients of the selected natural sweeteners

The data presented in Table 3 depicted the relationship between socio personal profile of respondents and their level of awareness regarding nutrients of selected natural sweeteners. It was found that family size and land holding of rural respondents had a positive and significant correlation with their level of awareness regarding nutrients of *jaggery/shakkar* where as education of the urban respondents had positive and significant correlation with their level of awareness regarding their nutrients of the honey.

### 3.3 Association of socio-personal profile of the respondents with their level of awareness regarding nutrients of the selected natural sweeteners

The data shown in Table 4 depicted that the socio personal profile of urban respondents had no association with their level of awareness regarding different nutrients of natural

sweeteners whereas in case of rural respondents occupation of the family had significant association with the level of awareness regarding nutrients of *jaggery/shakkar* and honey.

Occupation of the respondents had also significant association with the level of awareness regarding nutrients of honey. (Table 5)

**Table 3:** Relationship between socio personal profile of respondents and their level of awareness regarding nutritive value of different natural sweeteners, n = 200, n₁ = 100, n₂ = 100

| Variables | Jaggery | | | Shakkar | | | Honey | | | Stevia | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Urban (r value) | Rural (r value) | Overall (r value) | Urban (r value) | Rural (r value) | Overall (r value) | Urban (r value) | Rural (r value) | Overall (r value) | Urban (r value) | Rural (r value) | Overall (r value) |
| Age | -0.07 | -0.327 | -0.203$^{NS}$ | -0.07 | -0.327 | -0.203$^{NS}$ | -0.062 | -0.351 | -0.241$^{NS}$ | NA | NA | NA |
| Education of the respondents | 0.312 | 0.331 | 0.322$^{NS}$ | 0.312 | 0.331 | 0.322$^{NS}$ | 0.231* | 0.274 | 0.248$^{NS}$ | NA | NA | NA |
| Family size | -0.06 | 0.225* | -0.137$^{NS}$ | -0.06 | 0.225* | -0.137$^{NS}$ | -0.021 | -0.184 | -0.125$^{NS}$ | NA | NA | NA |
| Family Income | 0.281 | 0.369 | 0.325$^{NS}$ | 0.281 | 0.369 | 0.325$^{NS}$ | 0.108 | 0.218 | -0.175* | NA | NA | NA |
| Land holding | -0.029 | 0.208* | 0.11$^{NS}$ | -0.029 | 0.208* | 0.11$^{NS}$ | -0.059 | -0.022 | -0.23$^{NS}$ | NA | NA | NA |

* Significant at 5% level
 NS - Non significant
NA- Not Applicable

**Table 4:** Association of socio personal profile of urban respondents with their awareness level regarding different nutrients of natural sweeteners

| Variables | Jaggery | | | | | Shakkar | | | | | Honey | | | | | Stevia | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value |
| Caste | | | | | | | | | | | | | | | | | | | | |
| General | 33 | 1 | - | 34 | 1.9608 $^{NS}$ | 33 | 1 | - | 34 | 1.9608 $^{NS}$ | 34 | - | - | 34 | - | 34 | - | - | 34 | - |
| OBC | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | |
| SC/ST | 45 | - | - | 45 | | 45 | - | - | 45 | | 45 | - | - | 45 | | 45 | - | - | 45 | |
| BC | 16 | - | - | 16 | | 16 | - | - | 16 | | 16 | - | - | 16 | | 16 | - | - | 16 | |
| Occupation of the respondents | | | | | | | | | | | | | | | | | | | | |
| House Wife | 85 | - | - | 85 | 7.4074 $^{NS}$ | 85 | - | - | 85 | 7.4074 $^{NS}$ | 85 | - | - | 85 | - | 85 | - | - | 85 | - |
| Govt. Service | 11 | 1 | - | 12 | | 11 | 1 | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | |
| Business | - | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | - | - | |
| Labour | 3 | - | - | 3 | | 3 | - | - | 3 | | 3 | - | - | 3 | | 3 | - | - | 3 | |
| Occupation of Family | | | | | | | | | | | | | | | | | | | | |
| Farming | 5 | - | - | 5 | 3.0303 $^{NS}$ | 5 | - | - | 5 | 3.0303 $^{NS}$ | 5 | - | - | 5 | - | 5 | - | - | 5 | - |
| Govt. Service | 24 | 1 | - | 25 | | 24 | 1 | - | 25 | | 25 | - | - | 25 | | 25 | - | - | 25 | |
| Business | 45 | - | - | 45 | | 45 | - | - | 45 | | 45 | - | - | 45 | | 45 | - | - | 45 | |
| Labour | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | |
| Wage earner in foreign countries | 10 | - | - | 10 | | 10 | - | - | 10 | | 10 | - | - | 10 | | 10 | - | - | 10 | |
| Farming + Service | 2 | 1 | - | 3 | | 2 | 1 | - | 3 | | 2 | 1 | - | 3 | | 2 | 1 | - | 3 | |
| Marital status | | | | | | | | | | | | | | | | | | | | |
| Married | 89 | 1 | - | 90 | 0.1122 $^{NS}$ | 89 | 1 | - | 90 | 0.1122 $^{NS}$ | 90 | - | - | 90 | - | 90 | - | - | 90 | - |
| Single | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | |
| Widow | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | | 5 | - | - | 5 | |
| Family type | | | | | | | | | | | | | | | | | | | | |
| Nuclear | 99 | 1 | - | 100 | - | 99 | 1 | - | 100 | - | 100 | - | - | 100 | - | 100 | - | - | 100 | - |
| Joint | - | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | - | - | |

n₁ = 100
* Significant at 5% level
NS - Non significant

**Table 5:** Association of Socio personal profile of rural respondents with their awareness level regarding different nutrients of natural sweeteners n₂ = 100

| Variables | Jaggery | | | | | Shakkar | | | | | Honey | | | | | Stevia | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value | Low | Medium | High | Total | "χ" value |
| Caste | | | | | | | | | | | | | | | | | | | | |
| General | 26 | 1 | - | 27 | 2.731$^{NS}$ | 26 | 1 | - | 27 | 2.731 $^{NS}$ | 27 | - | - | 27 | 1.4182 $^{NS}$ | 27 | - | - | 27 | - |
| OBC | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | |
| SC/ST | 59 | - | - | 59 | | 59 | - | - | 59 | | 57 | 2 | - | 59 | | 59 | - | - | 59 | |
| BC | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | |
| Occupation of the respondents | | | | | | | | | | | | | | | | | | | | |
| House Wife | 89 | 1 | - | 90 | 0.1122 $^{NS}$ | 89 | 1 | - | 90 | 0.1122 $^{NS}$ | 90 | - | - | 90 | 23.4694* | 90 | - | - | 90 | - |
| Govt. Service | 8 | - | - | 8 | | 8 | - | - | 8 | | 6 | 2 | - | 8 | | 8 | - | - | 8 | |
| Business | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | |
| Labour | - | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | - | - | |
| Occupation of Family | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Farming | 10 | - | - | 10 | 100* | 10 | - | - | 10 | 100* | 10 | - | - | 10 | 5.5178* | 10 | - | - | 10 | - |
| Govt. Service | 27 | - | - | 27 | | 27 | - | - | 27 | | 25 | 2 | - | 27 | | 27 | - | - | 27 | |
| Business | 28 | - | - | 28 | | 28 | - | - | 28 | | 28 | - | - | 28 | | 28 | - | - | 28 | |
| Labour | 17 | - | - | 17 | | 17 | - | - | 17 | | 17 | - | - | 17 | | 17 | - | - | 17 | |
| Wage earner in foreign countries | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | | 12 | - | - | 12 | |
| Farming + Service | 3 | 2 | 1 | 6 | | 3 | 2 | 1 | 6 | | 3 | 2 | 1 | 6 | | 3 | 2 | 1 | 6 | |
| Marital status | | | | | | | | | | | | | | | | | | | | |
| Married | 97 | 1 | - | 98 | 0.0206 NS | 97 | 1 | - | 98 | 0.0206 NS | 96 | 2 | - | 98 | 0.0416 NS | 98 | - | - | 98 | - |
| Divorce | - | - | - | - | | - | - | - | - | | - | - | - | - | | - | - | - | - | |
| Widow | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | | 2 | - | - | 2 | |
| Family type | | | | | | | | | | | | | | | | | | | | |
| Nuclear | 98 | 1 | - | 99 | 0.0102 NS | 98 | 1 | - | 99 | 0.0102 NS | 97 | 2 | - | 99 | 0.0206 NS | 99 | - | - | 99 | - |
| Joint | 1 | - | - | 1 | | 1 | - | - | 1 | | 1 | - | - | 1 | | 1 | - | - | 1 | |

\* Significant at 5% level

NS - Non significant

## 4. Conclusion
Low level of awareness regarding nutrients and nutritive value of selected natural sweeteners was observed by 99 percentages of rural as well as urban respondents. So Subject Matter Specialist of Food and Nutrition Department should create awareness regarding nutrients and nutritive value of natural sweeteners.

## 5. References
1. Carocho M, Morales P, Ferreira IC. Natural food additives: Quo vadis? Trends Food Sci Technol. 2015;45:284–95.
2. Disse E, Bussier AL, Veyrat-Durebex C, Deblon N, Pfluger PT, Tschöp MH, *et al*. Peripheral ghrelin enhances sweet taste food consumption and preference, regardless of its caloric content. Physiol Behavior. 2010;101:277-281.
3. FAO. Codex Alimentarius, Commission Standards, Codex Standards for Honey, (1981/revised 1987/revised) Rome; c2001. p. 1-7.
4. Grembecka M. Sugar alcohols-their role in the modern world of sweeteners: a review. Euro Food Res Technol. 2015;241:1-14.
5. Hussain AL, Poveda V. Plant derived sweetening agents: Saccharides and polyol constituents of some sweetening plants. J Ethnopharmacol. 1990;28:103-115.
6. Ribeiro G, Santos O. Recompensa alimentar: mecanismos envolvidos e implicações para a obesidade. Revista Portuguesa de Endocrinologia, Diabetes and Metabolismo. 2013;8:82-88.
7. Mu'izzuddin A, Norazirah MN, Hanim A, Haziq M, Ohn Mar S. Acceptance of Stevia as a Sugar Substitute and its Determinants among Health Educated Individuals and its Determinants. Curr Res Nutr Food Sci, 2020, 8(1):226-237.