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RESEARCH ARTICLE

FOOD CONSUMPTION PATTERNS AMONG PUNJAB AGRICULTURAL UNIVERSITY FACULTY

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ABSTRACT

The goal of this study was to determine the food intake by the faculty of Punjab Agricultural University (PAU), Ludhiana. A random selection of 240 university faculty from PAU was made. A questionnaire was designed to assess general characteristics, daily food intakes among university faculty. Dietary survey was carried out by using "24 hour recall method" for three consecutive days and food intake was compared with the suggested dietary intakes (ICMR 2010) and percent adequacies were calculated. The food groups like pulses and legumes, roots and tubers, fruits, milk and milk products, fats and oils and sugar were more than suggested intake i.e. 91.49g (152.48%). 286.22g (143.11%),162.55g (162.55%),483.53ml (161.18%), 24.31g (121.55%), 25.25g (126.25%) respectively by females and 83.66g (111.55%). 300.40g (150.20%), 144.27g (144.27%), 505.06 ml (168.35%), 26.62g (106.48%), 23.41g (117.05%) respectively by male respondents. The mean daily intake of various food groups were inadequate like cereals, green leafy vegetables, other vegetables when compared with the suggested intakes i.e. 164.92g (61.08%), 54.62g (54.62%), 90.63g (45.31%) respectively by female respondents and 182.78 g (48.74 %), 82.17g (82.17%), 74.09g (37.04%) respectively in case of male respondents.

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INTRODUCTION

Good eating habits are an essential part of a healthy lifestyle. Healthy nutrition is an important factor in preventing many specific health problems of people such as vitamin A deficiency, iron deficiency anemia, and excess body weight. Also, eating behavior can affect long term health. Unhealthy eating habits such as skipping breakfast and excessive intake of foods with high carbohydrate and fat contents are the main factors causing nutritional problems. Risk of chronic diseases including obesity, cardiovascular disease, osteoporosis, and cancer may increase as a result of unhealthy nutrition. Dietary patterns in India are bound by religious, cultural and family value, are often maintained for generations, and not necessarily associated with other healthy lifestyle behaviours, such as increased physical activity. The vegetarian diet in India includes a wide range of vegetables, fruits, cereals, pulses, spices, seasonings and cooking practices and hence can have different levels of bio-availability and absorption for many nutrients (Shridhar, 2014). Traditionally, Indians like to have home-cooked meals – a concept supported religiously as well as individually. However, with times due to increasing awareness and influence of western culture, there is a slight shift in food consumption patterns among urban Indian families. Approximately 80-85% of the Indian population consumes commercially processed food, and a marked shift has occurred in consumer preferences towards energy-dense processed foods and away from nutrient-rich foods (Gupta *et al.* , 2010 and Misra, 2011). In almost the same manner eating habits have changed worldwide leading to an increased consumption of prepacked food generally containing high levels of sugar, fat, saturated fatty acids, trans-fatty acids and sodium (Jones and Richardson, 2007). Over the last few decades, consumers have become more conscious of their health and of weight control, and tend to be more aware of daily energy intake requirements and food nutrients (e.g. dietary fat) (Niva, 2007) .Good nutrition is an important part of leading a healthy lifestyle. Combined with physical activity our diet can help us to maintain a healthy weight and reduce risk of chronic diseases like heart disease and cancer and promote overall health. To maintain a healthy heart, active brain and optimally working muscles we must take care to eat a balanced diet that provides proper nutrients to our body.

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MATERIALS AND METHODS

A statistically adequate sample of 240 Punjab Agricultural University faculty members with equal proportions of Assistant Professors, Associate Professors and Professors was selected. The respondents were selected from Krishi Vigyan Kendras and four colleges of university i.e. Home Science, Basic Sciences, Agriculture and Agricultural Engineering College. The data was collected by personally administering the questionnaire to the university faculty of PAU. A well structured questionnaire was developed to elicit the general information, height, weight, income of family, background of the subjects, dietary intake (for 3 days), Dietary survey was recorded by using "24 hour recall method" for 3 consecutive days, using standardized containers for the experimental period. The food intake was compared with the suggested dietary intakes for balanced diet (ICMR 2010). The percentage adequacy of food intake was also calculated by comparing with the suggested dietary intakes by ICMR (2010).

Table 1. Mean Daily Food Intake by Female Respondents

Food groups	Assistant Professor Female (n=34)	Associate Professor Female (n= 45)	Professor Female (n=28)	Total female (107)	SDI
Cereals (g)	162.47 ±47.89	159.33±65.25	172.97±61.13	164.92±58.09	270
Pulses and Legumes (g)	90.12 ±57.24	106.58±64.83	68.93 ±53.71	91.49 ±61.09	60
Green Leafy Vegetables (g)	61.94±101.99	45.51±100.22	69.36 ±72.48	54.62 ±85.75	100
Roots and Tubers (g)	262.47±174.00	300.53±173.87	275.39±129.49	286.22±157.48	200
Other Vegetables (g)	101.82±112.82	90.24±106.99	86.61 ±73.55	90.63 ±90.98	200
Fruits (g)	110.06±159.16	200.58±197.40	165.18±116.62	162.55±164.73	100
Milk and Milk Products (ml)	486.35±207.51	526.60±172.82	410.89±145.86	483.53±182.77	300
Fats and Oils (g)	27.26 ±12.35	24.07 ±6.36	21.11 ±5.81	24.31 ±8.86	20
Sugar and Jaggery (g)	25.32 ±7.75	23.47 ±8.07	28.03 ±39.08	25.25 ±20.93	20

Table 2. Mean Daily Food Intake by Male Respondents

Food groups	Assistant Professor Male (n=46)	Associate Professor Male (n= 35)	Professor Male (n=52)	Total Male(n =133)	SDI
	(Mean±SD)	(Mean±SD)	(Mean±SD)	(Mean±SD)	
Cereals (g)	201.06±73.83	162.51±60.14	180.25±51.26	182.78±63.50	375
Pulses and Legumes (g)	84.10±71.22	81.80±63.64	84.52±60.35	83.66±64.66	75
Green Leafy Vegetables (g)	99.91±163.93	75.86±103.54	65.88±100.72	82.17±122.97	100
Roots and Tubers(g)	288.35±153.80	324.57±197.89	294.23±180.13	300.40±171.94	200
Other Vegetables (g)	78.26±102.00	44.71±76.23	85.38±82.43	74.09±84.49	200
Fruits (g)	119.69±166.19	179.83±183.95	142.07±161.70	144.27±169.20	100
Milk and Milk Products (ml)	507.72±212.75	569.74±158.18	459.17±135.08	505.06±175.69	300
Fats and Oils (g)	27.02±10.32	27.94±10.078	25.38±7.00	26.62±9.08	25
Sugar and Jaggery (g)	22.35±6.15	26.88±10.52	22.01±5.35	23.41±7.54	20

RESULTS AND DISCUSSION

Food Intake by Female Respondents

The average daily food intake of female university teachers is shown in Table 1. The percent adequacy of food groups was calculated by comparing the consumption with suggested intakes by ICMR (2010) for sedentary females.

Cereals

The most commonly consumed cereals among the female respondents in the present study were in the form of *paranthas*, *chapattis*, bread and biscuits followed by rice in the form of boiled rice, fried rice and maize in the forms of *chapattis* and sweet cornflakes and oats in the forms of muesli and porridge. The mean intake of cereals was 164.92g which was 61.08% adequate when compared with Suggested Dietary Intake (SDI) of 270g by adult sedentary females as suggested by ICMR (2010). The percent adequacy of cereals among adult women from Ludhiana District was 83.5% (Gungeet, 2004). Jain (2012) reported the mean daily cereals intake by home garden and non home garden group women was 133.6g and 176.2g.

Pulses and legumes

The data revealed that average daily intakes of pulses and legumes was 91.49g which was 152.48% adequate when compared with Suggested Dietary Intake (SDI) of 60 g. On the contrary Sodhi (2000) and Gungeet (2004) reported an inadequate intake of pulses among Punjabi women. The percent adequacy of pulses and legumes was 52.4% to 67.3 % among Punjabi women between the age of 21-60 years (Kaur, 2011)

Green Leafy Vegetables

The green leafy vegetables mostly consumed by the respondents were mustard, fenugreek, spinach and coriander leaves.

The mean daily consumption of green leafy vegetables by female university teachers were 54.62g which was 54.62% adequate when compared with Suggested dietary intake of 100g. Sodhi (2000) and Goyal (2003) also reported lesser intake of green leafy and other vegetables by Punjabi women.

According to Jain (2012) the mean daily consumption of green leafy vegetables in home garden group and non home garden group women was 43.3g and 21.7g during winter season.

Roots and Tubers

The most common roots and tubers consumed by the female respondents were potatoes, carrot, radish and onions. Radish and onion were taken as salad, *stuffed parantha* and vegetables. Carrots were mostly consumed as salad, *gajrela,* juice and vegetables. Potatoes were taken in the form of *stuffed, parantha, tikki, samosa* and potato chips. The data revealed that average daily intakes of roots and tubers was 286.22g which was 143.11% adequate when compared with suggested dietary intake of 200g. On the contrary Jain (2012) reported that mean daily intake of roots and tubers in home garden and non home garden group women was 96.5g and 79.3g during the winter season.

Other vegetables

The mean daily consumption of other vegetables by female respondents was 90.63g which was 45.31% adequate when compared with suggested dietary intakes of 200g. Kaur (2011) also reported that the consumption of all vegetables was inadequate. According to Jain (2012) the mean daily intake of other vegetables in Home garden group and non home garden group ladies was 50g and 29.3g in winter season.

Fruits

The mean daily intakes of fruits among female respondents were found to be 162.55g which was 162.55 percent adequate when compared with suggested dietary intake of 100g. Kaur (2011) reported that the mean daily intake of fruits by 21-60 years old women ranged between 64.2 to 175.1g respectively. Jain (2012) reported that mean daily consumption of fruits among home garden and non home garden group women was 315.2g and 147.4g respectively.

Milk and Milk products

The data revealed that mean intake of milk and milk products i.e. channa, curd, Butter milk etc was 483.53ml which was 161.18 percent adequate when compared with suggested dietary intakes of 300 ml. On the contrary Gungeet (2004) reported an intake of 231g of milk and milk products among adults Punjabi women. According to Jain (2012) the mean daily consumption of milk and milk products among home garden group and non home garden group was 211.9 and 230.9g, respectively during winter season.

Fats and oils

The mean daily fats and oils intake among female respondents was 24.31g which was 121.55 percent adequate when compared with suggested dietary intake of 20g. Similar result was reported by Sodhi (2000) higher intake (25.3g) of fats and oils among Punjabi women whereas Gungeet (2004) reported an intake of 21.0g.

Sugar and Jaggery

The mean daily intakes of sugar and jaggery among female respondents was 25.25g which was 126.25 percent adequate when compared with suggested dietary intakes of 20g. This was due to the fact that majority of the faculty was in the habit of consuming tea three to four times a day. Chandla (2006) also reported higher consumption of sugar by the adults Punjabi women. Kaur (2011) reported the percent adequacy being 87, 113, 115and 149 % in 21-30, 31-40, 41-50, 51-60 years respectively.

Food Intake by Male Respondents

The average daily food intake of male university teachers is shown in Table 2. The percent adequacy of food groups was calculated by comparing the consumption with suggested intakes by ICMR (2010) for sedentary males.

Cereals

The mean intake of cereals was 182.78 g which was 48.74 % adequate when compared with Suggested Dietary Intake (SDI) of 375 g for adult sedentary males. Miglani *et al*. (2014) observed that the intake of cereals was 299.6g in office workers of Ludhiana city. Batra (2014) reported that mean daily intake of cereals was adequate and significantly ($p \leq 0.05$) higher in Higher income group (444±27.23g) as compared to Middle income group (434±24.34g).

Pulses and legumes

Average daily intakes of pulses and legumes among males respondents was 83.66 g which was 111.55% adequate when compared with SDI of 75g for adult sedentary males. Batra (2014) reported the intake of pulses and legumes was 69±8.23g in males of middle income group and 71±9.32g in higher income group.

Green Leafy Vegetables

The mean daily consumption of green leafy vegetables by male respondents was 82.17g which was 82.17% adequate when compared with suggested dietary intake of 100g. Similar results was reported by Bhatt (2015), the intakes of green leafy vegetables was lower among males field, lab and office workers that was 0.0, 60.0 and 63.3g respectively. Batra (2014) also reported the lower intakes of green leafy of vegetables by males of Middle income group and Higher income group i.e. 59±19.56g and 57±17.90g respectively.

Roots and Tubers

The data revealed that average daily intakes of roots and tubers among male respondents was 300.40g was 150.20% adequate when compared with suggested dietary intake of 200g. According to Bhatt (2015) the mean consumption of roots and tubers among field, lab and office workers was 155.0g, 186.0g and 136.7g respectively.

Other vegetables

The mean daily intakes of other vegetables by male respondents were 74.09g which was 37.04% adequate when compared with suggested dietary intakes of 200g. Similar

results was reported by Bhatt (2015), the mean daily consumption of others vegetables was much lower than the suggested intake of 200g among field, lab and office workers, the adequacy being 45, 21.8 and 47.5% respectively. Miglani *et al.* (2014) found a much lower daily consumption of other vegetables i.e. 59.4g by the office workers.

Fruits

The mean daily consumption of fruits among male respondents was found to be 144.27g which was 144.27% adequate when compared with Suggested dietary intakes of 100g. Batra (2014) reported the mean consumption of fruits among males of middle income group and high income group was 88±12.87g and 81±14.07g respectively. The inadequate consumption of fruits by the adult men was reported by Miglani *et al.* (2014).

Milk and Milk products

The data revealed that mean intake of milk and milk products among male respondents was 505.06 ml which when compared with SDI of 300ml was found to be 168.35 percent adequate. According to Bhatt (2015) the mean daily consumption of milk and milk products by the field workers, lab workers and office workers was 379.9, 440.8 and 490.7 ml which was 126.7, 147.0 and 163.6 % adequate. An adequate consumption of milk was also reported by Batra (2014), the daily milk consumption being 342ml and 356 ml in middle and high income group men. High intake of milk and its products among men were also reported by Gupta *et al*. (2010).

Fats and oils

The mean daily fats and oils intake among male respondents was 26.62 g which was 106.48 percent adequate when compared with suggested dietary intake of 25g. According to Bhatt (2015) the mean intakes of fats and oils by the field workers was 20.0g, 23.2g and 26.5g respectively. More than adequate consumption of fats and oils by Punjabi men was also reported by Batra (2014) and Miglani *et al*. (2014).

Sugar and Jaggery

The data revealed that mean intake of sugar and jaggery among male respondents was 23.41g which was 117.05 percent adequate when compared with suggested dietary intakes of 20g. Batra (2014) reported a higher intake of sugar i.e. 38 and 35 g in low and middle income group men. Similarly, a much higher intake i.e. 41.9g by the office workers was reported by Miglani *et al.* (2014). Gera and Khetarpaul (2000) also reported higher intake of sugar in males.

Conclusion

The 24 hour recall method was used for three consecutive days to assess the dietary intake. The food intake was compared with the suggested dietary intakes (SDI) for balanced diet (ICMR 2010).The mean daily intake of various food groups like pulses and legumes, roots and tubers, fruits, milk and milk products, fats and oils and sugar were more than SDI in both female and male respondents whereas the mean daily intake of various food groups like cereals, green leafy vegetables, other vegetables was inadequate when compared with the SDI in both female and male respondents.

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