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To assess food adulteration related awareness of literate female homemakers in Chandigarh and detection of adulteration in food items purchased by them

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Abstract

The addition of chemicals, coal tar dyes, brick dust, formalin, urea, sand etc. into the food through the malpractice of adulteration is turning the food into a poison. In this case awareness regarding adulteration, common adulterants and government regulations and acts of female homemakers who are generally responsible for buying food for the family can play a very important role.

In the present study 100 female homemakers residing in Chandigarh were selected through convenient sampling and surveyed. 20 female homemakers were randomly selected from 100 surveyed female homemakers and 5 food samples (wheat flour, oil, turmeric, salt and milk) were collected from each of those 20. The food samples were tested by using standard tests provided by FSSAI.

The findings of the study revealed that though the literate female homemakers knew about the adulteration of food items and its harmful effects on health but they had poor knowledge regarding the common adulterants of food items. All the respondents used to detect the adulteration by their senses like visual inspection, touching and tasting and no one used the tests provided by FSSAI. Only 1% respondents knew about the tests provided by FSSAI to detect adulteration. 87% respondents knew whom to complain against adulteration but only 19% among them had complained. They used to complain the seller and not to consumer forum or FSSAI. 80% respondents knew that there are government regulations and acts in India to prevent adulteration but 75% among them did not know the name of particular regulation or act. Among the food samples collected from the households of 20 female homemakers, adulteration was present in milk, turmeric, salt and oil and not in wheat flour. Water was present in 100% samples and starch in 45% milk samples. Artificial colors and chalk powder or yellow soap stone powder were present in 100% samples of turmeric and colored saw dust was present in 90% samples. 70% salt samples were adulterated with chalk and Iodine was not present in 30% salt samples. Argemone oil was used as adulterant in 85% of the oil samples. Thus the present study concluded that literate female homemakers residing in the area of Chandigarh have low awareness about the adulteration, common adulterants in food items and government laws and acts to curb the adulteration and most of the food samples collected from the households of 20 literate female homemakers were adulterated. Government, Panchayats and Public authorities should create awareness about quality standards, danger of consuming adulterated foods, consumer rights etc. through campaigns and national awareness programmes, so that homemakers can buy foodstuffs with proper diligence and discretion.

Keywords: Food adulteration, related awareness, literate female homemakers

Introduction

Food is essential to the sustenance of life. Food may be defined as anything eaten or drunk, which meets the needs for energy, body building, regulation and protection of the body [1]. Quality of food is an extremely important aspect of human life as it is directly related to health issue of a person. All consumers want to get the maximum quantity of a commodity for as low price as possible. This attitude of the consumers in conjunction with the intension of the traders as well as the manufacturer to increase the profit margin as high as possible generates a vicious circle. So the quantity of the commodity gets reduced through 'Adulteration'. Adulteration of food cheats the consumer and can pose serious risk to health in some cases [2]. According to FSSAI (2006) adulteration is defined as the addition or subtraction of any substance to or from food, so that the natural composition and quality of food substance is affected. FSSAI termed adulteration as a deep rooted social evil. Food is declared adulterated if:

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- A substance is added which depreciates or injuriously affects it.
- Cheaper or inferior substances are substituted wholly or in part.
- Any valuable or necessary constituent has been wholly or in part abstracted.
- It is an imitation
- It is colored or otherwise treated, to improve its appearance or if it contains any added substance injurious to health.
- For whatever reason its quality is below the standard [3].

Types of adulteration

Food items can be adulterated intentionally or unintentionally.

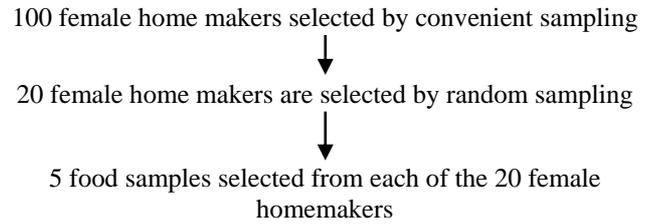
Intentional Adulteration: Intentional adulteration is addition of sand, marble chips, stones, mud, chalk powder, water, mineral oil, coal tar, dyes etc. in food products. Common forms of intentional food adulteration are: addition of water or urea to liquid milk; extraneous matter to ground spices; addition of chalk to sugar, white powdered stone to salt, water to honey, chicory to coffee, colored leaves and iron fillings to tea etc.

Incidental Adulterants: Incidental adulteration includes pesticide residues, tin from can, droppings of rodents and larvae in foods etc. Metallic contamination with arsenic, lead, mercury can also occur incidentally. The most common incidental adulterants are pesticides. DDT and malathion residues may be present on the plant product much more than their safe limits [4].

According to annual report of FSSAI, the percentage of adulterated samples has reached 23.3% (2016-17) from 12.8% (2011-12) [5]. In India, generally it is the responsibility of the female homemakers to buy and prepare the food for family. Thus in country like India, the awareness of female homemakers regarding food adulteration is very important. They can play a very important role in eliminating the problem of adulteration as generally female homemakers used to buy the food stuff for home [6].

Methodology

In present study, literate female homemakers (age group 20-40 years), residing in urban area of Chandigarh, were selected conveniently and surveyed. Testing of food samples collected from respondents was also performed for detection of adulteration.



Inclusion criteria

- Married female homemakers were selected for the study.
- Female homemakers willing to give information were included in the study.
- Female homemakers who were literate were included.

Exclusion criteria

- Female homemakers not willing to give information were not included in the study.
- Female homemakers who were illiterate/ uneducated.
- Female homemakers who did not used to buy food stuffs for home themselves were not included in the study.

Results

46% subjects were in the age group of 20-30years and 54% subjects were in the age group of 30-40years. Out of total subjects, 22% (n=22) were educated till matric (Primary, 8th and 10th), 8% (n=8) were educated till 12th, 30% (n=30) were educated till graduation, 40% (n=40) had educated level of post graduation and above. In present study all the subjects belonged to low and middle income group. All the subjects knew about the adulteration of food items. All subjects were aware that adulteration in food items has harmful effects on health.

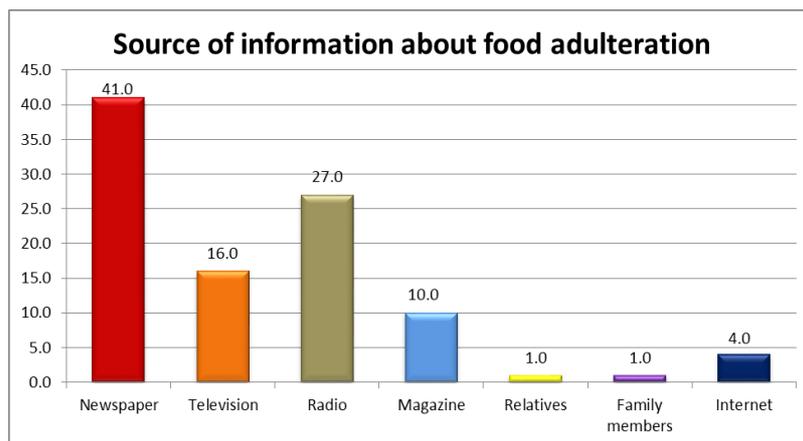


Fig 1: Source of information about adulteration.

Most of the subjects used to get the information about adulteration through newspaper followed by radio, television, and magazine respectively. In this study less number of subjects used to get the information from internet. Only 1% subjects got the information from relatives and 1% from family member. A study conducted in Bijnor city to assess the

awareness of food adulteration among consumer, revealed that most of the respondents (57.6%) used to get the information about adulteration from television closely followed by 56.08% from radio and 56.08% from discussions. 51.2% used to get information from newspaper, 51.2% from computer, 36% from mobile and 29.6% from magazine [7].

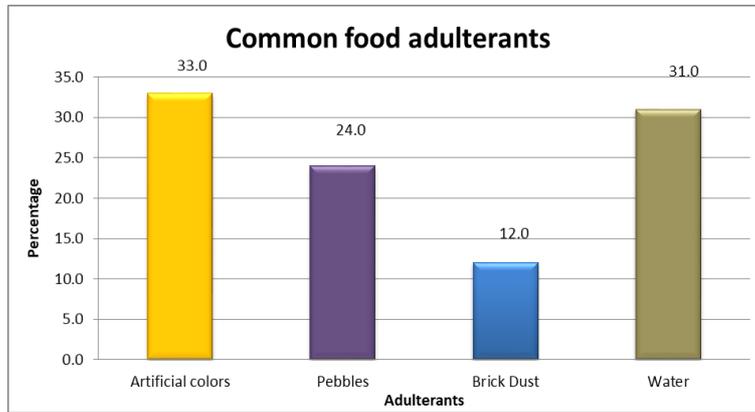


Fig 2: Awareness of female homemakers regarding common adulterants in food items.

All the subjects had chosen those adulterants that can be easily detected by sight like artificial colors, pebbles, brick dust and water. No subject had chosen the adulterants that were a little difficult to detect like formalin, urea etc. No significant difference was found between the education level and awareness about common adulterants in food items (p-

value= 0.161). In a study conducted in Jorhat town of Assam by selecting 120 women consumers to find out the awareness of women consumers regarding food safety, results showed that low income group had medium knowledge and middle income group had low knowledge about common adulterants [8].

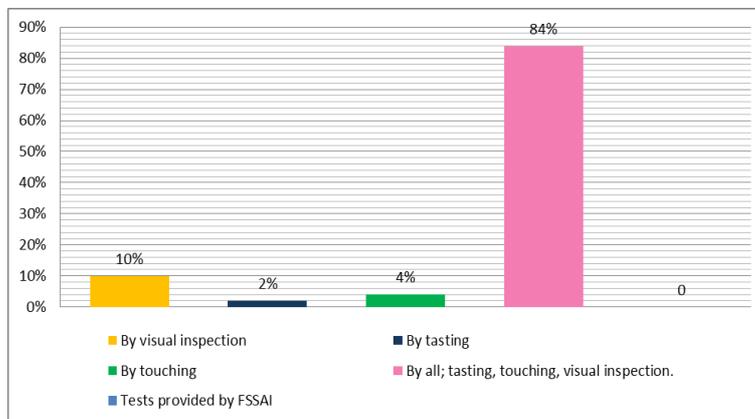


Fig 3: Criteria used by literate female homemakers to detect adulteration in food items.

Most of the subjects 84% used to detect the adulteration by all the three criteria (visual inspection, tasting and touching). All the subjects in this study used to detect the adulteration using their senses. No subject used the tests provided by FSSAI to detect adulteration in food items. Study conducted among

women in area of Rae Bareli to assess the knowledge of diseases related to adulteration of foods and knowledge of government acts showed similar results. Out of all respondents majority of subjects (38%) used to detect the milk adulteration by the smell of milk [9].

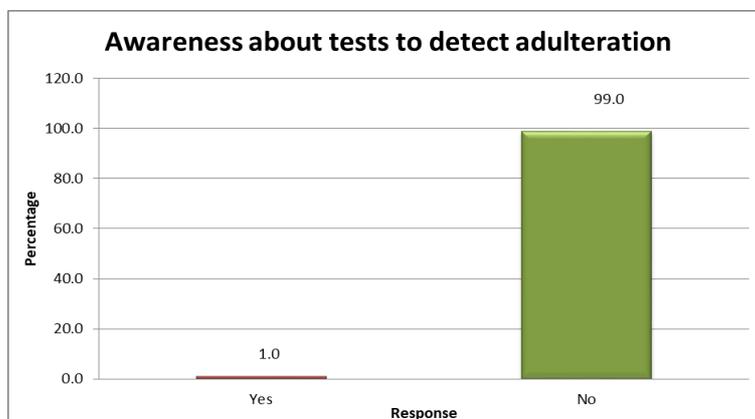


Fig 4: Awareness of literate female homemakers regarding tests to detect adulteration in food items.

Out of 100 subjects, only 1% subjects knew about tests to detect adulteration in food items and 99% did not know. Similar results were found in a study conducted in Chandigarh to find out the impact of health education package related to food adulteration on knowledge and practices of

women. 70% of the respondents were literate and majority (80%) were housewives. The study showed that none of the subjects were aware of the physical and chemical test employed to detect to adulterant [10].

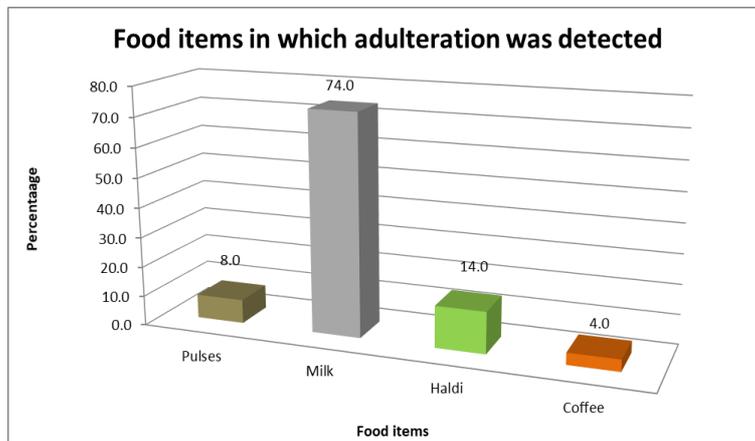


Fig 5: Food items in which literate females homemakers found adulteration.

Majority of the subjects found the adulteration in milk. It is easy to find adulteration in food items like pulses, milk, turmeric and coffee because of the easy detection of adulterants either due to the specific shape, taste and appearance of adulterants or the way in which these food items are consumed. No significant difference was observed between the education level of respondents and their ability to detect adulterants in food items (p-value= 0.773). In a study conducted in Washim city of Maharashtra to assess the

awareness about Prevention of Food Adulteration Act-1954 among working women and their attitude towards seeking legal remedy in case of adulteration, respondents were asked to list the adulterated food items and they enlisted edible oils and ghee, spices, cereal grains, ground nuts, sago and bhagar, readymade flours, pulses and besan, sugar, tea, honey, milk and milk products, fruits and vegetables and papad as adulterated food items [11].

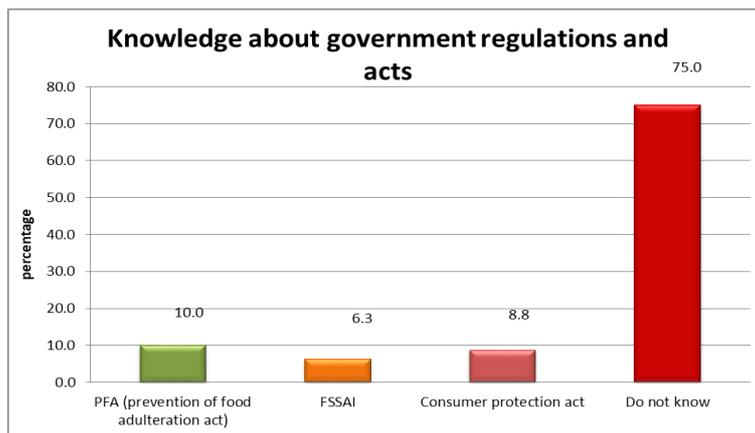


Fig 6: Knowledge of literate female homemakers regarding government regulation and acts.

80% of the respondents were aware that there are government laws and regulations in country to protect the consumer from adulteration. But majority of the respondents did not know the name of particular regulation or act. No significant difference was observed between the education level of respondents and their knowledge about government regulations and acts to curb adulteration in country (p-value= 0.959). In present study, results are in accordance with a study conducted in

Cuddalore District to study consumer protection awareness among rural consumers. The respondents were unfamiliar with their rights regarding adulteration and misuse of weights and measures. The consumers were less aware of consumer legal law [12]. In a study conducted in urban slum of Bhilai to assess the knowledge of homemakers regarding food adulteration, only 38.7% respondents had knowledge about consumer protection act [13].

Table 1: Knowledge about whom to complain against adulteration, whether they had filled complain against adulteration and whom they had complained against adulteration.

Knowledge about whom to complain against adulteration:	Frequency	Percent
Yes	87	87.0
No	13	13.0
Total	100	100.0
Whether complained against adulteration:	Frequency	Percent
Yes	19	19.0
No	81	81.0
Total	100	100.0
Complained to whom against adulteration:	Frequency	Percent
Food seller	19	19.0
Complaint to consumer forum, FSSAI etc.	0.0	0.0
Total	100	100.0

In present study, only 19% respondents had complained against adulterated food. No significant difference was observed between education level and complaining against adulteration (p -value= 0.587). In a study conducted in 68.5% households of rural area of Wardha district to study buying practices and prevalence of adulteration in selected food items, results revealed that only 24.7% respondent knew whom to complain in case of adulteration but all of them accepted that they had never filed any complaint [6]. Bhatt Shuchi *et al* (2012) carried out a study among 300 respondents on impact of media and evaluation on food

practices in urban area of Varanasi, India. Results revealed that respondents had found adulteration in food items many times but they did not take any action against shopkeeper. Majority of the people agreed that they can complain against adulteration and accepted that they never filed any complaint against shopkeeper and never took any action against shopkeeper. 80.5% respondents used to take another food in exchange of that adulterated food item [14].

Results for detection of adulteration in sampled food items

Table 2: Detection of adulteration in selected food items purchased by female homemakers.

Sr. No.	Food Item	Adulterant	No. of samples adulterated	Percentage of samples adulterated
1.	Milk	Water	20	100%
		Detergent	0	0%
		Starch	9	45%
		Urea	0	0%
		Formaline	0	0%
2.	Turmeric	Artificial color	20	100%
		Colored saw dust	18	90%
		Chalk powder or yellow soap stone powder	20	100%
3.	Salt	Chalk	14	70%
		Absences of Iodine	6	30%
4.	Oil	Argemone	17	85%
5.	Wheat flour	Chalk powder	0	0%

Conclusion

In present study it could be concluded that literate female homemakers residing in the area of Chandigarh have low awareness about adulteration, common adulterants in food items and government laws and acts in India to curb the adulteration and most of the food samples collected from the households of 20 literate female homemakers were adulterated. Government, Panchayats, Public Authorities and Local bodies should create awareness about quality standards, dangers of consuming adulterated food, consumer rights etc. through campaigns and national awareness programmes, so that homemakers buy foodstuffs with proper diligence and discretion. Creating awareness among female homemakers is very important because they are responsible for most of household purchase decisions. They buy goods and services not only for themselves but also for their families, hence play more than a pivotal role in seller consumer cycle. Therefore, there is an urgent need to recognize women as prime consumers, educate them regarding business malpractices, their rights and responsibilities so as to make them alert consumers.

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