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Research Note

ACCEPTANCE OF SOLAR COOKER BY WOMEN IN AGRA CITY

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Solar Energy is a very large, inexhaustive source of energy. Solar energy is one of the most prominent of the non-conventional sources. It could supply all the present and future energy needs of the world on a continuing basis. It is an environmentally clean source of energy but the main problem is that it is a dilute source of energy. Even in the hottest regions on Earth, the solar radiation flux available rarely exceeds 1KW/m^2 which is a low value for technological utilization.

The use of solar energy for cooking is one of the fascinating area in the context of rural development. Several types of solar cookers have been developed which include-Box type, Parabolic type, Lens type and Steam type cookers. out of these acceptance of only two types of solar cooker i.e. Box type solar cooker and electric solar cooker is there.Hence, they were selected for the present study with the following main objectives :

1. To study the impact of solar cooker on energy and time saving.
2. To study the individual practices and acceptance related to solar cooker.
3. To identify the various general problems of solar cooker and operation.

METHODOLOGY :

To fulfill the objectives of the study, the collection of data was done in two parts :–

(1) By Socio-Survey Method. (2) By Experimental Method.

The questionnaire cum interview method was utilised to collect information from the adopters. The data were collected in the month of May in Agra city. The period for experimental study was extended from June to July, which covered all the cooking in solar cooker and electric solar cooker. Thirty vegetarian dishes (Appendix 1.) were selected to find out the differences in the colour, texture,appearance, taste, flavour and time required to cook food in solar cooker and electric solar cooker. Purposive random sampling technique was used in selection of sample for the present study. Statistical comparison was drawn on different aspects of cooking. Data were analysed and presented in terms of simple percentage.

Appendix

SELECTION OF FOOD DISHES

List of 30 vegetarian dishes

1. Boil Potato	16. Matar Aloo Vegetable
2. Rice Kheer	17. Palak Vegetable
3. Sago Kheer	18. Matar Pulav
4. Rajmah	19. Namkeen Dalia
5. Potato Vegetable	20. Capsicum Vegetable
6. Roasted Groundnut	21. Roasting Dalia
7. Roasted Basan	22. Palak Dal
8. Bottle gourd vegetable	23. Bagan Bharta
9. Upma	24. Carrot Halwa
10. Cholla (Whole gram)	25. Stuffed tomato
11. Dal	26. Cut Ladyfinger Vegetable
12. Stuffed Bhindi	27. Mixed Vegetable
13. Dam Aloo Vegetable	28. Khatta Aloo
14. Custard	29. Paneer Curry
15. Torai Vegetable	30. Soya bean Curry Vegetable

RESULTS AND DISCUSSION :

Impact of Solar Cooker in Energy and Time Saving : Maximum time was consumed in cooking of dishes by solar cooker. It was obvious that time taken by both the cookers were different i.e. 3 to 4 hours in solar cooker and 1 to 2 hours in electric solar cooker. Contradictory

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electric solar cooker proved more efficient in cooking much dishes at normal time as compare to solar cooker. Experiment results showed that number of dishes can be cooked in less time by electric solar cooker whereas ordinary solar cooker required much time. Therefore, electric solar cooker is liked by most of the people. Contrary to this, the quality of cooked food was much liked by the people prepared in ordinary solar cooker than in electric solar cooker.

Time saving was the important criterion which was reported by the cent percent adopters in cooking of food (solar cooker) in terms of physical presence was not required, but it was a time consuming device.

Acceptance of solar cooker : To compare the different aspects of cooking like colour, texture, appearance, flavour and taste in the solar cooker and electric solar cooker, two parameters were used for evaluation i.e. evey good and good.

It is evident from the table-1 that percentage proportion of very good dishes numerically (60% in terms of colour) in solar cooker was more than electric solar cooker. This may be due to the reason that in solar cooker the dishes maintained colour due to even and modulate heating. In terms of texture (33%), electric solar cooker was very good than solar cooker (20%) and this may be due to the reason that in solar cooker sometimes the dishes were not properly cooked. Forty percentage adopters liked the appearance of the food dishes cooked in electric solar cooker than the box type of solar cooker. Taste and flavour wise the food dishes cooked in solar cooker were preferred by majority of adopters.

Table 1. Comparison of Different Physical Characters in Solar Cooker and Electric Solar Cooker

Character of food Cooked	Solar cooker		Electric solar cooker	
	Very good	Good	Very Good	Good
Colour	18(60)	12(40)	12(40)	16(80)
Texture	6(20)	24(80)	10(33·3)	40(66·7)
Appearance	10(33·3)	20(66·7)	12(40)	18(60)
Taste	14(46·7)	16(53·3)	16(53·3)	14(46·7)
Flavour	17(56)	13(44)	10(33·3)	20(66·7)

General Problems of Solar Cooker Related to Technology and Operation : The main problem found in the present study was of shifting the solar cooker from one place to another place resulting in wastage of energy. Fifty percentage of the adopters faced construction related problem while 22 percent adopters faced operational problems and 40 percent adopters suffered general problems related to use of solar cooker as indicated in table-2.

Various technological problems were faced by the adopters main problems found were: Removal of black point from the cooking vessels

Table 2. Problems Related to Use of Solar Cooker

Problems	No. of Adopters	Percentage
Technology Related Problems :		
Black Paint removed	6	12·0
Rubber gasket loss	5	10·0
Rubber gasket was broken	4	8·0
Mirror was broken	8	16·0
Reflector was broken	1	2·0
Body was damaged	1	2·0
Operation Related Problems :		
Heat loss	1	2·0
Over cooking	4	8·0
Food was not properly cooked	3	6·0
Hands burn	9	18·0
General Problems :		
Heavy weight	9	18·0
Adjustment of reflector	7	14·0
Sweating from the body	2	4·0
Time to time check the Food stuff	2	4·0

(12 percent), breaking of the mirror (16 percent) and damage of body (2 percent) during cooking. Other problems reported were loss of rubber gasket (10%) and damage of rubber gasket (8%), which delayed the cooking time.

Operational problem faced by adopters were overcooking (8%), food not properly cooked (6%) and hands burned (18%). Eighteen percent adopters faced general problem related to heavy weight of the solar cooker, while (8%), reported that adjustment of reflector during cooking time.

The practices adopted for the use of solar cooker were mainly for cooking purpose (96%), to keep food warm and as sun drier to preserve vegetables and other food items (30%).

It was also found that the highest use of solar cooker–cent percent was during summers followed by winters (60%), while only (2%), reported that they used it throughout the year even during the monsoon period when ever the sun permitted.

CONCLUSION :

Electric solar cooker was accepted by majority of the women in Agra city. In the context coluor (60%) adopters favoured cooking in solar cooker than in the electric solar cooker (40%). Where as in terms of texture (33·3%), adopters were satisfied of cooked food in electric solar cooker than the box type solar cooker (20%). The appearance of dishes cooked in both the cookers were same. The flavour of the food cooked in solar cooker was much better and appreciated by majority of the adopters. The main problem found in the use of solar cooker was shifting it from one place to another. Fifty percent adopters faced construction related problems (i.e. removal of black paint from the cooking vessels, breaking of mirrors, damage of the body or the rubber gasket) 22% women faced operations related problem (i.e. over cooking, food not properly cooked hands burned) and 40% suffered general problems. (i.e. heavy weight, adjustment of reflector during cooking etc.). Use of solar cooker saves time and energy of women because there is no need of physical presence during cooking time. Results indicated clearly that all types of food could be cooked through out the year either using solar energy or only electric energy or with combination of two sources which could significantly reduce the consumption of electricity, time, energy and fire wood specially in developing countries.

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