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Impact of Food Processing and Preservation Training on Knowledge, Attitude, Practice and Level of Empowerment of Rural Women

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ABSTRACT

The present study was conducted to know the impact of vocational training on Rural Women in terms of their knowledge, attitude and practice towards Food Processing and preservation and level of empowerment. The sample size for the study was 120, sixty respondents were participants of vocational training on Food Processing and preservation conducted by Krishi Vigyan Kendras (KVKs) and remaining sixty respondents were non-participants. Findings of the study reflect that highest percentage participant respondents had medium level of knowledge on food processing and preservation and moderately favourable attitude towards food processing and preservation as an income generating venture. Majority of the participant respondents fall in medium level of adoption category. However among non-participant respondents, largest percentage belonged to low adoption category. Such variation among the participant and non-participant respondents reflects effect of vocational training programmes on Food processing and preservation in improving knowledge, attitude and level of adoption. Moreover significant change in the level of empowerment among the participant respondents after the vocational training was observed in the study.

Key words: *Impact; Vocational training; Food processing and preservation; Empowerment.*

Food processing and preservation has an important role to play in minimising the post-harvest losses as well as providing livelihood security to those who are involved in it. Though India is the second largest producer of food, only a very negligible percentage of it is processed and large percentage go waste. The estimated loss in fruits and vegetables in India is around 30-35 per cent accounting for an economic drain of Rs. 240 lakh crore annually (*Kumar, 2019*). Rural women may play a key role in reducing food loss and in ensuring food and nutritional security of the household members. They inherit good amount of traditional knowledge in processing and preservation of locally available fruits and vegetables. Many of them practice processing and preservation for household consumption. Processing and preservation of fruits and vegetables with the existing knowledge are inexpensive however while performing the tasks with existing traditional knowledge, the quality, safety and shelf-life of the product remains in doubt. Exposure to trainings for acquiring scientific knowledge on food processing and preservation improves the quality of such products while enhancing the knowledge of the

participants. Considering these the present study was conducted to study the impact of vocational training on rural women in term of their level of knowledge on food processing and preservation, level of attitude and practices they follow. The study further attempts to find out the change in level of empowerment of the rural women.

METHODOLOGY

The study was carried out in the state of Assam where 23 numbers of Krishi Vigyan Kendras (KVKs) are functioning under administrative control of Assam Agricultural University (AAU), Jorhat. For selection of respondent, six KVKs were identified based on the number of vocational trainings conducted on 'Food Processing and preservation' in the preceding five years of the study. A list of rural women who participated in the vocational trainings on 'Food processing and preservation' conducted by the KVK was prepared considering certain criteria. From the prepared list ten respondents under each KVK were selected using simple random sampling method. Thus total sixty participant respondents were selected from six KVKs. An equal number of rural women were selected as control group for comparing the level of knowledge, attitude and practice with the participant respondents. The non-participant respondents were randomly selected from participants' village.

Socio economic status : Socio economic status (SES) was measured in terms of economic and social indicators such as educational attainment, occupation, land holding, type of house, source of drinking water, sanitary facility, material possession, organizational membership etc. While calculating the Socio economic status, Udai Pareek revised scale, 2017 was adopted with slight modification. The scores of individual respondents for all indicators were calculated and categorized the respondents as low SES, Medium SES and high SES based on the mean and standard deviation obtained from the scores.

Category	Score
Low SES	Below ($\bar{X}$-SD)
Medium SES	$\bar{X}$-SD to $\bar{X}$+SD
High SES	Above ($\bar{X}$+SD)

Knowledge : For assessing the knowledge of the respondents on processing and preservation of fruits and vegetables, a knowledge test was developed with total 42 knowledge statements. The knowledge test was constructed covering ten subheads such as 'what is processing and preservation', 'importance of preservation', 'selection of fruits and vegetables for preservation', 'selection of utensils and cutleries', 'methods of preservation', 'knowledge on preservatives', 'packaging and storage', 'reasons for spoilage of preserved products', 'registration and licencing of product' and 'cost calculation of product'. The questions in the knowledge test were dichotomous. For each correct answer, assigned score was "1", otherwise "0". Score of knowledge test for individual respondent was calculated and based on the mean and SD of the obtained scores, respondents were categorized as below:

Category	Score
Low level of knowledge	Below ($\bar{X}$-SD)
Medium level of knowledge	$\bar{X}$-SD to $\bar{X}$+SD
High level of knowledge	Above ($\bar{X}$+SD)

Further, ranking of knowledge was done based on the average mean score of the statements under the subheads.

Attitude : For measuring attitude of the respondents towards Food processing and preservation an attitude scale was developed, comprising 32 statements. Response for each item was recorded on a five point continuum scale *viz.,* 'Strongly agree', 'agree', 'undecided', 'disagree' and 'strongly disagree', with a scoring pattern of 5,4,3,2 and 1 respectively for positive items and 1,2,3,4 and 5 respectively for negative items. Total attitude score for each respondent was obtained by summing up the scores of all items. Based on the mean and SD of the obtained scores, respondents were categorized as below:

Category	Score
Less favourable attitude	Below ($\bar{X}$-SD)
Moderately favourable attitude	$\bar{X}$-SD to$\bar{X}$+SD
Highly favourable attitude	Above ($\bar{X}$+SD)

Extent of adoption and status of adoption : Extent of adoption was measured using an adoption index with response category 'Complete adoption', 'partial adoption' and 'no adoption' and assigned scores 2, 1 and 0 respectively. Percentile was calculated based on the obtained scores and respondents were categorized as Low, medium and high level of adoption.

Status of adoption for the present study is defined as the involvement of women in income generating activities after receiving vocational training i.e. whether

the respondents had started the enterprise, still in perceived adoption stage, continuing it or discontinued. Response code assigned for different categories were as below:

Categories	Code
Not yet used	1
Using the produce only for household-consumption	2
Adopted for income generation, but discontinued	3
Adopted the technology for income generation	4

Empowerment indices for measuring socio economic empowerment of rural women : An empowerment index including five dimensions namely economic, social, political, psychological and legal dimension of women empowerment were considered for measuring the transformation in the empowerment level. Total number of indicators was 46. The indicators were binary, while '1'stands for empowerment and '0' for non-empowerment. Composite empowerment indices were then developed to measure the overall level of empowerment of the rural women. Level of empowerment was calculated considering complete empowerment as '1'. Percentile of the scores were calculated and categorized as low, medium and high level of empowerment. Since the study focuses on impact of the vocational training on empowerment of women, therefore 'before' and 'after' exposure of the participant respondents were calculated in terms of change in level of empowerment. Nonparticipant respondents were asked about the earlier position and the transformation taken place in their status after the last five years. Responses for the nonparticipants were also recorded as 'before' and 'after'. The empowerment index (EEI) of individual respondents for different dimensions was calculated using following formula:

$$EEI = \frac{OS}{MOS} \times 100 \qquad PsEI = \frac{OS}{MOS} \times 100$$

$$SEI = \frac{OS}{MOS} \times 100 \qquad LEI = \frac{OS}{MOS} \times 100$$

$$PEI = \frac{OS}{MOS} \times 100$$

EEI= Economic empowerment index
SEI= Social empowerment Index,
PEI= Political empowerment index
PsEI= Psychological empowerment index
LEI= Legal empowerment index
OS= Obtained score ,
MOS=Maximum obtainable score

Thus the Women Empowerment Index (EI) for an individual respondent was calculated with the following formula:

Empowerment Index (EI) = EEI + SEI + PEI + PsEI + LEI

After collection of data, the gathered data was coded, tabulated and statistically analysed After collection of data, the gathered data was coded, tabulated and statistically analysed i.e. frequency and percentage, Paired t test, Independent sample t test etc.

RESULTS AND DISCUSSION

Socio economic status of the respondents : The data (Table 1) shows that highest percentage (60.00%) participant respondents belonged to medium socio economic category and 20.00 per cent each belonged to low and high socio economic category. Among the non-participants, 60.00 per cent respondents belonged to medium socio economic category followed by 26.67 per cent high and 13.33 per cent from low socio economic category. However, a difference in mean is observed which was 48.97 in case of participants and 40.47 for non-participants, indicating a better socio economic status among the participant respondents. *Prasad and Kushwala (2015)* reported that beneficiary farm women had better and improved level of socio-economic status than non-beneficiary farm women.

Table 1. Distribution of respondents according to their socio economic Status (SES)

Category	Participant (n_1=60)		Non-participant (n_2=60)	
	No.	%	No.	%
Low SES	12	20.00	16	26.67
Medium SES	36	60.00	36	60.00
High SES	12	20.00	8	13.33
Mean :	48.97		Mean :	40.47
SD	: 10.60		SD :	11.24

Knowledge of respondents on food processing and preservation : The data (Table 2) on level of knowledge on food processing and preservation shows that 61.67 per cent participant respondents had medium level of knowledge on food processing and preservation followed by 20.00 per cent with high level and 18.33 per cent with low level of knowledge. In case of nonparticipant respondents 65.00 per cent respondents had medium level of knowledge followed by low level of knowledge. But it is observed that there is large variation in the mean score between participant and non-

Table 2. Distribution of respondents according to level of knowledge on food processing and preservation

Level of knowledge	Participant (n_1=60) No.	%	Non-participant (n_2=60) No.	%
Low	11	18.33	13	21.67
Medium	37	61.67	39	65.00
High	12	20.00	8	13.33
Mean :	28.92		Mean :	7.86
SD :	4.96		SD :	4.21

participant respondents. The mean score of participant respondent was 28.92 whereas it is only 7.86 in case of non-participants. From the data, it may be interpreted that the level of knowledge among participant respondent was noticeably higher than the non-participants. Such large gap in level of knowledge may be attributed to the fact that the non-participants had only traditional knowledge on Food processing and preservation whereas the participant respondents were enriched with the vocational training along with their traditional knowledge.

The finding is in line with *Sharma et al. (2013)*, *Malabasari and Hiremath (2016)* and *Anithakumari et.al. (2021)*.

Table 3. Ranking of knowledge on food processing and preservation

Area	MS	Rank
What is processing and preservation	0.91	II
Importance of preservation	0.98	I
Fruits and vegetables for preservation	0.78	IV
Selection of utensils and cutleries	0.60	VIII
Methods of preservation	0.61	VII
Knowledge on preservatives	0.74	V
Packaging and storage	0.73	VI
Reasons for spoilage of preserved products	0.87	III
Registration and licencing of product & enterprize	0.43	IX
Cost calculation of product	0.37	X

Ranking of knowledge according to the mean score obtained by the participant respondents : It is observed from the Table 3 that 'importance of processing and preservation' ranked I with mean score 0.98, followed by 'what is processing and preservation' ranked II with mean score 0.91 and 'reasons for spoilage' ranked III with mean score 0.87. On the other hand, 'cost calculation of product' ranked lowest with mean score 0.37 and 'registration and licencing of product' ranked second lowest i.e. IX with mean score 0.43.What is processing and preservation, importance of preservation, selection of fruits and vegetables for preservation these are some basic knowledge on processing and preservation and emphasis might have been given on these areas during the training.

Table 4. Distribution of respondents according to attitude towards Food processing and preservation

Level of attitude	Participant (n_1=60) No.	%	Non-participant (n_2=60) No.	%
Unfavourable	9	15.00	0	0
Moderate	42	70.00	60	100.00
Highly	9	15.00	0	0
Mean:	94.03		Mean:	93.00
SD :	10.43		SD :	2.36

Attitude of respondents towards food processing and preservation : Attitude of both participant and nonparticipant respondents towards food processing and preservation was measured and result is presented in the Table 4. From the data it is seen that a large percentage (70.00%) of participant respondents had moderately favourable attitude towards food processing and preservation as an income generating venture, whereas 15.00 per cent had unfavourable and equal percentage had highly favourable attitude. The large percentage of respondents in the moderately favourable category may be due to the income they were making from this venture or opportunity they foresee in this sector but on the other hand associated uncertainty, competitions in marketing and different challenges experienced by the respondents might had some influence on the attitude of the participant respondents towards the vocation. Among the non-participant respondents all the respondents had moderately favourable attitude.

Level of adoption of food processing and preservation technology by the respondents : Data presented in Table 5 shows that, among the participant respondents, highest percentage (66.67%) fall in medium level of adoption, followed by low level (21.67%). The large percentage of medium level of adoption among Food processing and preservation may be because of the fact that many rural women traditionally practice pickle making at household level with their inherited knowledge and after participating in the training they might adopted scientific practices along with their existing practice. However, among non-participants largest percentage (90.00%) belonged to low adoption category and only a small percentage belonged to

medium adoption category. Findings are in line with *Santhi et al. (2013)* and *Kushwah et.al (2015)*.

Table 5. Distribution of respondents according to level of adoption of technology

Level of Adoption	Participant (n_1=60) No.	%	Non-participant (n_2=60) No.	%
Low	13	21.67	54	90.00
Medium	40	66.67	6	10.00
High	7	11.67	0	0

Table 6. Ranking of Food processing and preservation practices according to level of adoption

Statement	MS	Rank
Preservation is done when the fruits and vegetables are abundant	1.83	II
Fresh and healthy fruits and vegetables are used for preservation	1.65	IV
Stainless steel utensils and cutleries are used	1.42	IX
Ingredients are used in right quantity	1.58	V
Preparation is done within recommended time	1.67	III
Recommended preservatives are used	1.87	I
Right amount of preservative is added	1.58	V
Recommended colour and flavour are used	1.43	VIII
Preserved items are not kept open	1.56	VI
Not using wet hands for taking out pickle	1.56	VI
Packets of preserved products are sealed	1.13	X
Keeping preserved items in airtight container	1.13	X
Containers for storing products are sterilized	1.5	VII
Good quality packaging material is used	0.78	XIII
Date of packaging is mentioned on the labels	0.82	XII
Expiry date is mentioned on the labels	0.85	XI
Registration is done for marketing	0.6	XIV
Labour cost is included in cost calculation	1.43	VIII
Cost of raw materials is included in cost	1.43	VIII

Ranking of food processing and preservation practices according to level of adoption by the participant respondents : The degree of adoption varies for different practices depending upon the intricacies of the technology, availability of essential inputs and many other factors. Ranking of food processing and preservation practices was done considering different aspects of the technology and data presented in Table 6. It is observed that 'Use of recommended preservatives' was the highly adopted practice with mean score 1.87, followed by 'Preservation is done when the fruits and vegetables are abundant' with mean score 1.83. These reflect the consciousness of the respondents in using preservatives in right amount and preserving fruits and vegetables during the time of abundance. Contrary to these, 'Registration with appropriate authority is done for marketing' was found to be the lowest adopted practice with mean score 0.60, followed by 'Good quality packaging material is used' ranked XIII with mean score 0.78 and 'Date of packaging is mentioned on the labels'ranked XII with mean score 0.75. In the ranking of knowledge, it was observed that Knowledge on registration and packaging occupied lowest ranks which might be one of the reasons for low level of adoption of these practices.

Status of adoption of the food processing and preservation technology : A considerable percentage i.e. 55.00 per cent respondents had started utilizing the technology for income generation whereas 18.33 per cent respondents had never practised or utilized the skill they learnt in the vocational training. Around 22.00 per cent respondents produced for household consumption and 5.00 per cent discontinued due to different factors (Table 7). In a previous study conducted by *Onwurafor and Enwelu (2013)* reported that out of 300 trained women only 99 women started micro enterprises and rest of them utilized the products for their personal consumption which showed only a third of them entered in to the venture of marketing the products.

Table 7. Distribution of participant respondents according to status of adoption of the technology

Status of adoption	No.	%
Not yet used	11	18.33
Using the produce for household-consumption	13	21.67
Adopted for income generation, but discontinued	3	5.00
Adopted the technology for income generation	33	55.00

Level of empowerment of the respondents before and after : Table 8 reflects that among the participant respondents, 61.67 per cent respondents attained high level of empowerment which was 26.67 per cent before with a hike of 35.00 per cent. Low level of empowerment was reduced by 20.00 per cent, which was 30.00 per cent before and 10.00 per cent after. Among the non-participant respondents only 18.33 per cent attained high level of empowerment which was 13.33 per cent before. It may be interpreted that among the participants, there had been a considerable lift in level of empowerment from a lower level to a higher level, clearly showing impact of the vocational training they had participated.

Similar findings related to Socio-economic empowerment of rural women in different dimensions of empowerment were reported by *Nazir et al. (2012)*, *Deharia (2009), Sheheli (2012)* and *Kapila (2015).*

Table 8. Distribution of participant and non-participant respondents according to level of empowerment

Level of empow-erment	participant				non-participant			
	Before		After		Before		After	
	No.	%	No.	%	No.	%	No.	%
Low	18	30.00	6	10.00	19	31.67	16	26.67
Medium	26	43.33	17	28.33	32	53.33	33	55.00
High	16	26.67	37	61.67	8	13.33	11	18.33

Impact of vocational training on socio economic empowerment of rural women : To find out the significance of change in empowerment of both participant and nonparticipant respondents, paired sample 't' test was applied and value presented in Table 9. The data reflects that change in empowerment level of participant respondents before and after was significant with 't' value -11.803 at 95% Confidence Interval.

Data also shows that change in empowerment level of nonparticipant respondents before and after was significant with 't' value -11.275 at 95% Confidence Interval. However, from Table 10 significant difference was observed between empowerment of participant and nonparticipant respondents after training with 't' value 7.643, whereas no significant difference was observed between the empowerment of participant and nonparticipant respondents before. The calculated t-value for equality of means was 1.699 at 95% Confidence Interval.

It may be interpreted that though there had been significant difference in empowerment among both participant and nonparticipant respondents before and after, but after the training there had been significant difference in level of empowerment of participant and nonparticipants respondents. In other words it can be said that though among both the groups empowerment was taking place but among the participants improvement was significantly higher than the nonparticipants.

CONCLUSION

It may be summarized that highest percentage participant respondents had medium level of knowledge, moderately favourable attitude towards food processing and preservation and fall in medium level of adoption which was considerably better than the non-participant respondents. This shows impact of the vocational training on the participant respondents. However, in some areas of Food processing and preservation, such as 'methods of preservation', 'knowledge on preservatives', 'cost calculation', 'packaging and storage' the knowledge of participant respondents was also very low. Since the trainees of vocational trainings are expected to start some venture after participating in the training, proper attention should be given on covering all areas while designing and implementing vocational trainings. The moderately favourable attitude of the respondents reflects that they want to engage themselves in such income generating activities which needs to be encouraged with follow-up support. Regarding adoption of Food processing and preservation practices, 'Registration with appropriate authority', 'Good quality packaging material' were lowest adopted

Table 9. Change in level of empowerment of respondents

Pairs	Mean	Std. Deviation	Std. Error Mean	't'	Sig. (2-tailed)
ParticipantBefore-After	-.17693	.18360	.01499	-11.803	.000**
NonparticipantBefore-After	-.16900	.18358	.01499	-11.275	.000**

95% Confidence interval of the difference.

Table 10. Empowerment of participant and nonparticipant respondents Independent Samples Test (t-test for Equality of Means)

Level of empowerment of participant and non-participant	't'	Sig. (2-tailed)	Mean difference	Std. Error difference	Lower	Upper
Before	1.699	.090	.04080	.02401	-.00645	.08805
After	7.643	.000**	.18287	.02393	.13578	.22995

95% Confidence interval of the difference.

practices which have implications on marketing of the products. Hence participants should be motivated for adoption of such practices which in turn has impact on marketing and ultimately on sustainability of the venture. Though among both the groups empowerment was taking place but among the participant respondents improvement was significantly higher than the nonparticipants which clearly imply impact of the vocational training on the level of empowerment of the participants.

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