Women Centric Farm to Market Value Chain of Local Crops for Nutrition Security

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BACKGROUND

- INDIAN AGRICULTURE IS UNIQUE AND WELL KNOWN FOR ITS AGRO-BIODIVERSITY
- THE FOOD BASKET CONTAINS IN ADDITION TO MAJOR FOOD CROPS, MANY REGIONALLY IMPORTANT CROPS LIKE JOWAR, BAJRA, SMALL MILLETS AND DICOCCUM WHEAT
- PROVIDE GOOD NUTRITION AND COMPARE VERY WELL WITH RICE AND WHEAT
- SUPERIOR IN PROTECTIVE NUTRIENTS VIZ., VITAMINS, MINERALS, DIETARY FIBRE AND PHYTO-CHEMICALS
- IN RECOGNITION OF THIS, THESE ARE CONSIDERED AS " NUTRITIOUS AND THERAPEUTIC GRAINS"

- **THE CHANGED DIETARY PATTERN HAS LED TO WIDE SPREAD NUTRITION DEFICIENCY**
- **OBESITY THE GLOBAL THREAT AND LINKED TO SEVERAL CHRONIC DISEASES LIKE CVD, DIABETES AND CERTAIN TYPE OF CANCERS**
- **DEVELOPMENT AND MARKETING OF HEALTH FOODS IN COLLABORATION WITH INDUSTRIES, INSTITUTION OR OTHER AGENCIES ARE THE NEED OF THE HOUR**
- **PRODUCTION, MARKETING AND PROMOTION OF HEALTH FOODS OF RÉGIONAL GRAINS ON POSITIVE RESULT ORIENTED TECHNOLOGIES MAY PLAY A PROACTIVE ROLE TO COMBAT NON COMMUNICABLE DISEASES AND ALSO HELPS IN PROTECTING A GLOBAL RESOURCE**
- **STUDY WAS UNDERTAKEN ON INDIAN REGIONAL CEREAL GRAINS AND MILLETS TO EXPLORE THE INHERENT, TECHNOLOGICAL OPPORTUNITIES FOR BETTER UTILIZATION OF RESOURCE IN DESIGNING VALUE ADDED PRODUCTS AND SUITABLE TECHNOLOGIES FOR PROMOTION OF ETHNIC FOODS THROUGH COTTAGE INDUSTRIES**

OBJECTIVES

- **PROMOTION OF PRODUCTVITY AND PRODUCTION OF LOCAL CROPS AND ASSOCIATED LEGUMES GROWN IN TRADITIONAL CROPPING SYSTEM THROUGH FARMER PARTICIPATORY TECHNOLOGICAL INTERVENTIONS**

- **INTRODUCTION OF WOMEN FRIENDLY TECHNOLOGIES TO REMOVE DRUDGERY AND INCREASE EFFICIENCY**

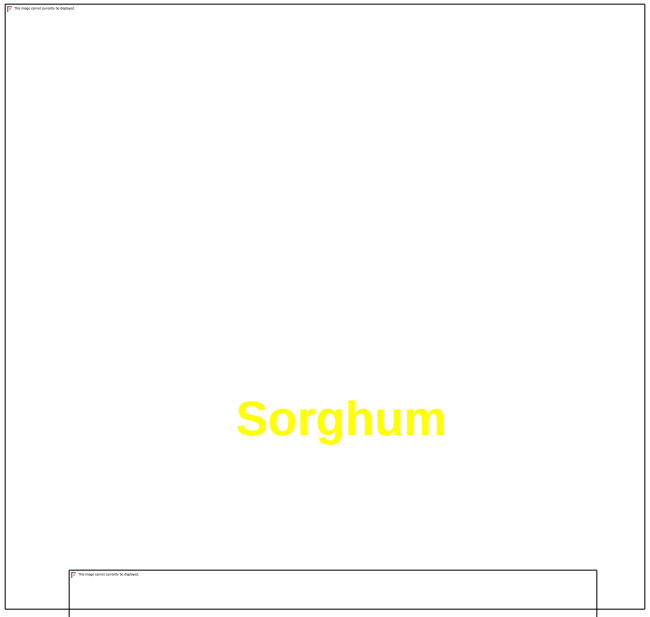
- **PROMOTION OF HOUSEHOLD CONSUMPTION OF LOCAL NUTRITIOUS GRAINS THROGH NUTRITION EDUCATION FOR WOMEN, MEN AND CHILDREN IN IMPROVING THEIR HOUSEHOLD FOOD AND NUTRITIONAL SECURITY**

- **EXPANSION OF RESEARCH CAPACITY FOR IMPROVING PROCESSING TECHNOLOGY AND EVALUATE THE POTENTIAL MILLET FOR DIVERSIFIED UTILIZATION**

- **EXTENSION OF SUCCESSFULLY DEMOSTRATED WOMEN CENTRIC FARM TO MARKET VALUE CHAIN WITH VALUE ADDED PRODUCTS DEVELOPED FROM LOCAL CROPS FOR ENHANCING THE HOUSE HOLD INCOME THROUGH SELF HELP GROUPS**

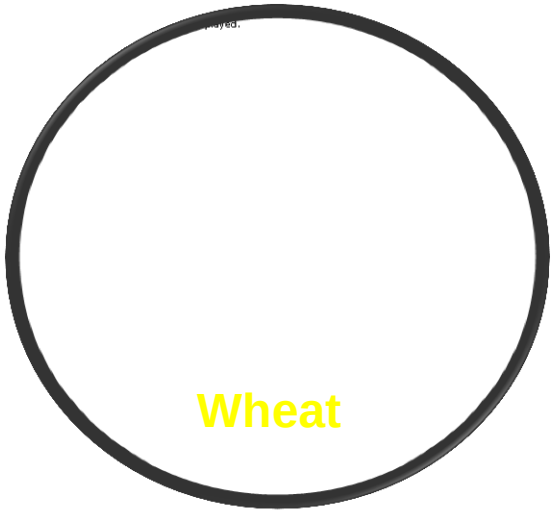
INHERENT TECHNOLOGICAL OPPORTUNITIES FOR VALUE ADDITION IN LOCAL CEREALS AND MILLETS

Little Millet



Sorghum

Foxtail Millet

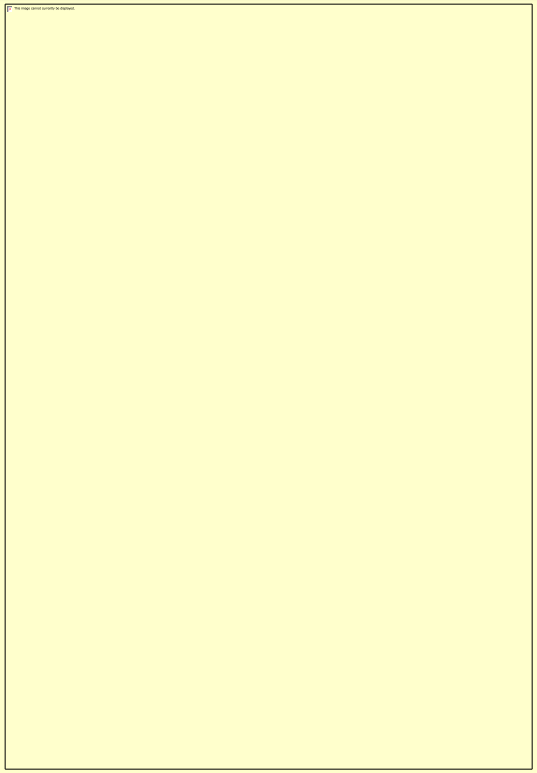


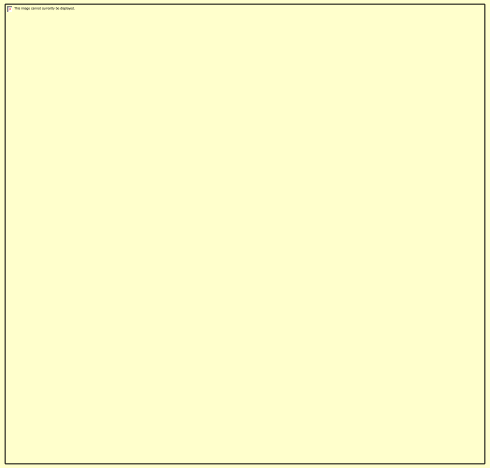
Wheat

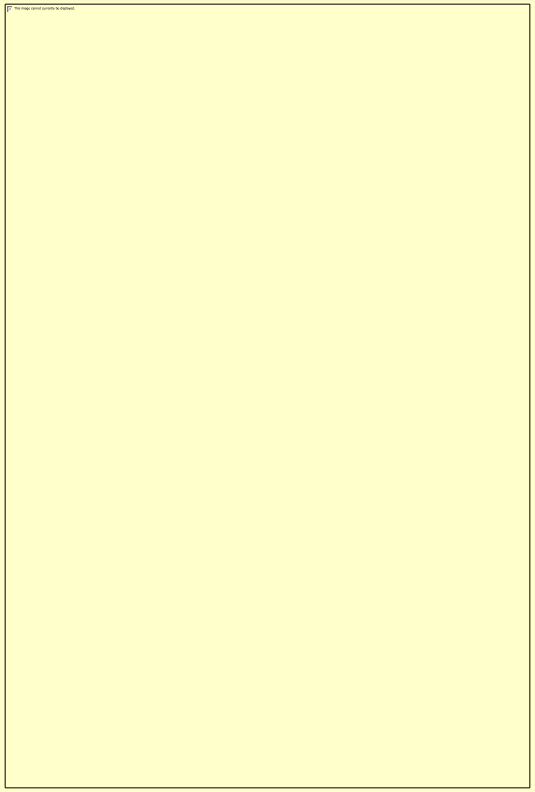
Finger Millet

Bajra

VALUE ADDING STRATEGIES FOR PRODUCTION AND SUSTAINABLE USE OF INDIGENOUS SMALL MILLETS







FOXTAIL MILLET **RAGI** **LITTLE MILLET**

(Setaria italica) **(Eleusine coracana)** ***(Panicum sumatrense)***

- **AMONG THE FOOD GRAINS, MILLETS ARE THE CHEAPEST AND WIDELY AVAILABLE SOURCE OF ENERGY**

- **INTAKE IS HIGHEST AMONG THE POOR INCOME FAMILIES**

- **USE OF MILLET IS LESS POPULAR AMONG URBAN POPULATION DUE TO NON AVAILABILITY OF SUITABLE POST HARVEST TECHNOLOGIES SIMILAR TO RICE AND WHEAT**

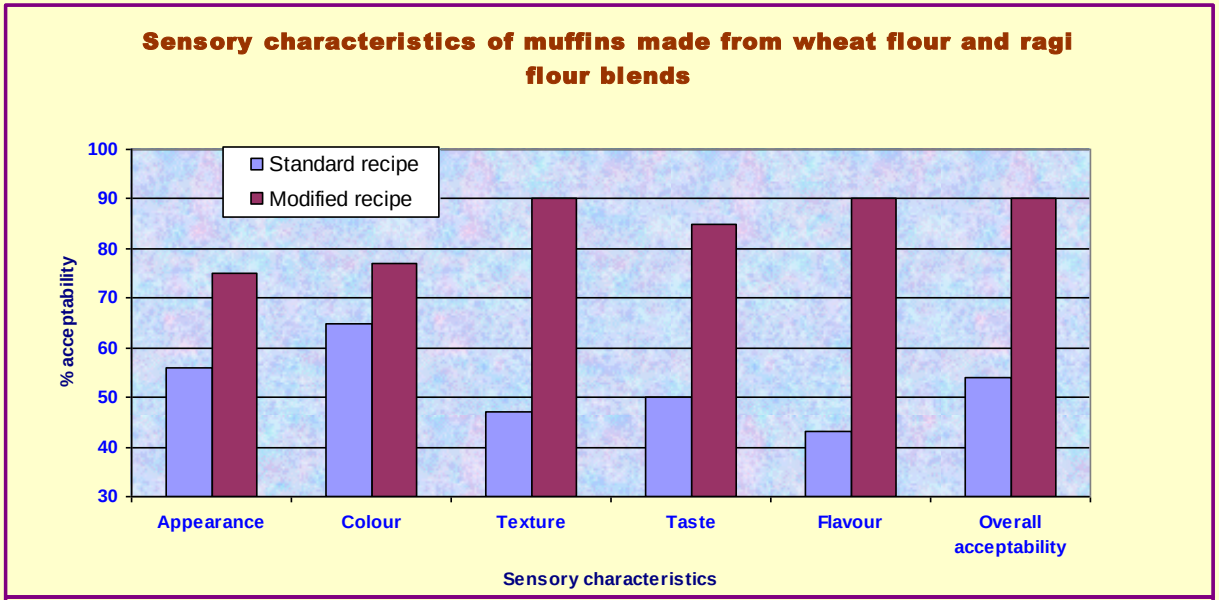
MILLETS IN BAKERY INDUSTRY

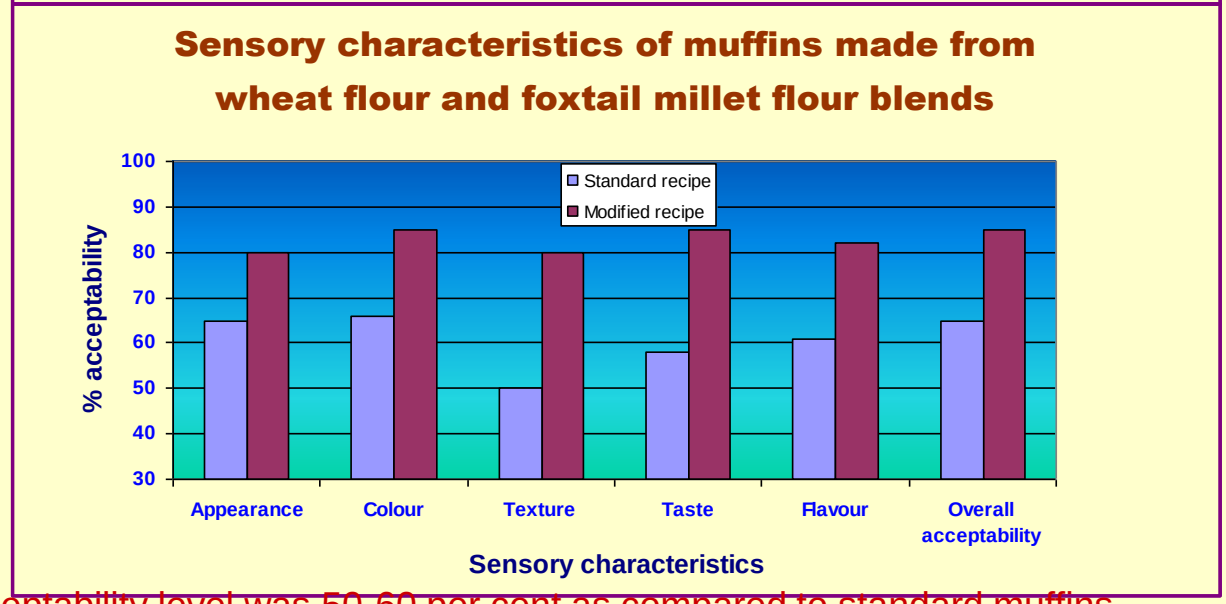
- FOXTAIL MILLET BISCUITS ARE TASTY AND POSSESS GOOD SPREADING QUALITY AND CRISPY
- MELTING MOMENT BISCUITS PREPARED FROM FOXTAIL MILLET AT 50% LEVEL SCORED THE HIGHEST FOR OVERALL ACCEPTABILITY FOLLOWED BY PEA NUT, NAN KHATAI AND CHILLI BISCUITS
- MODIFICATION OF STANDARD RECIPE WITH INCREASE IN FAT BY 20% IMPROVED THE PHYSICAL SENSORY QUALITY CHARACTERS OF MILLET MUFFINS
- MILLET BASED BAKERY PRODUCTS ARE RICH IN FIBRE, MICRONUTRIENTS AND HAVE GOOD POTENTIAL TO ENTER BAKERY INDUSTRY AS VALUE ADDED PRODUCTS

NUTRIENT COMPOSITION OF FOXTAIL MILLET BASED BISCUITS (100g)

Nutrients	Nankhatai	Melting moment	Peanut	Chilli biscuits
Calories	560	560	568	550
Protein (g)	8.0	6.0	24.4	7.0
Fat (g)	35.0	48.0	38.0	40
Carbohydrate (g)	64.0	60.0	58.0	53
Mineral (g)	6.0	7.0	7.0	5.0
Iron (mg)	6.0	6.0	9.0	6.0
Fiber (g)	8.0	7.0	10.0	7.0
Calcium (mg)	79.0	59	98	59



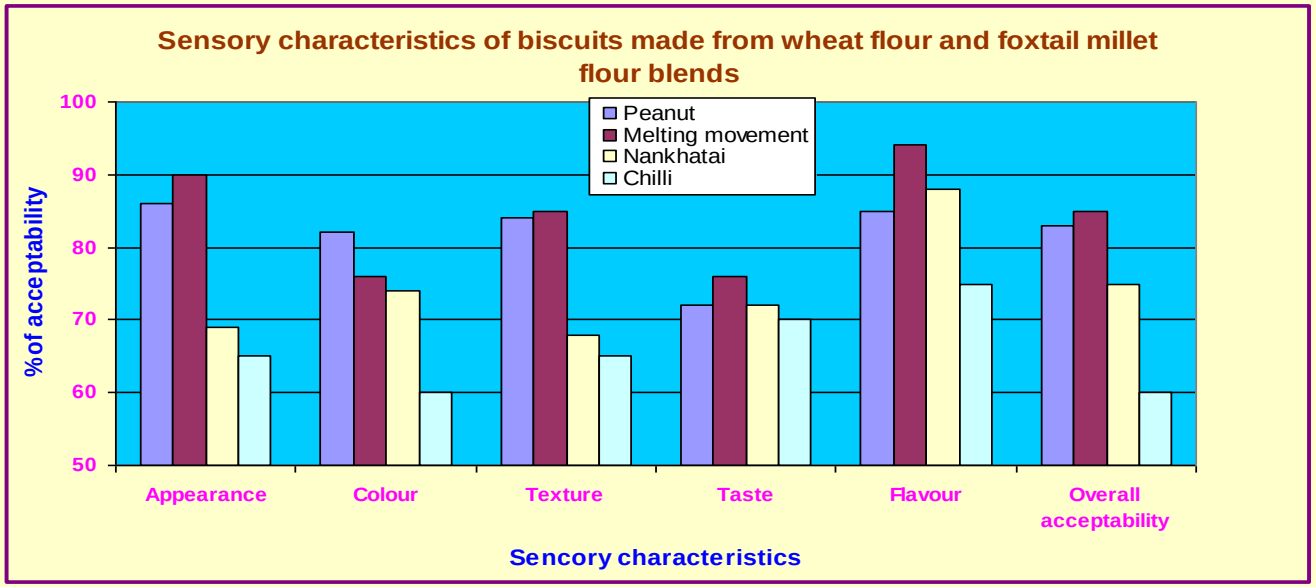





* The overall acceptability level was 50-60 per cent as compared to standard muffins.
* Modifications of the standard recipe with increase in fat to 25 per cent improved the physical and sensory quality characteristics of millet muffins.
* Sensory quality scores of ragi muffins were on par with standard muffins and it was highly acceptable for taste and texture

Physical characteristics of biscuits made from wheat flour and foxtail millet flour blends

Biscuits	No. of biscuits in 100 gm		Diameter (cm)	
	Normal	Millet based	Normal	Millet based
Peanut	16	16	4.11	4.18
Melting moments	8	9	4.87	4.40
Nankhatai	10	10	3.57	3.26
Chilli	9	9	5.00	5.00



*The mineral content of foxtail millet based cookies was higher than refined flour biscuits.

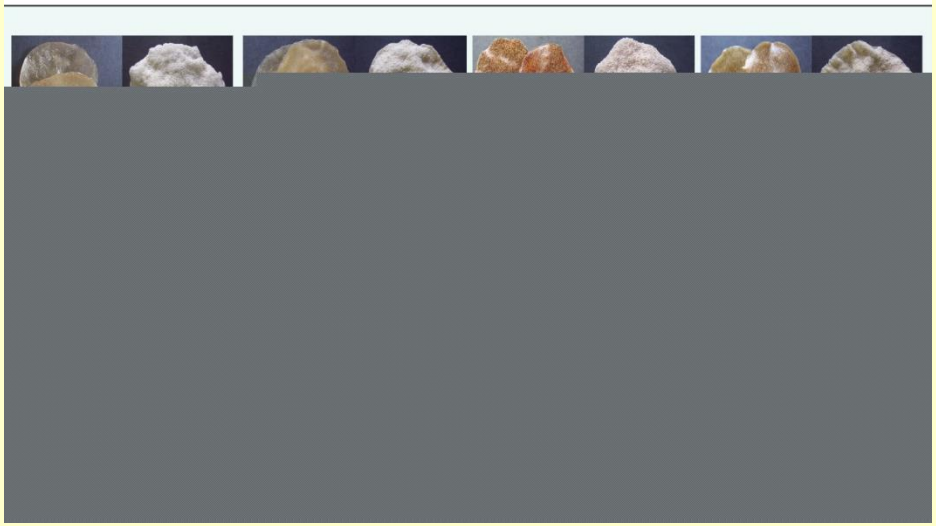
*Melting movement biscuits prepared from foxtail millet at 50% level scored highest for overall acceptability followed by peanut, nankhatai and chilli biscuits.

*The zinc content was higher in peanut and melting moment biscuits.

INDIGENOUS METHOD OF PAPAD PREPARATION

'NERE HAPPALA'

Plate 2. Step inolved in preparation of traditional *Nere happala*




Nere happala


Nere happala packed

Plate 4. Large scale production of traditional *Nere happala* by home based processed units

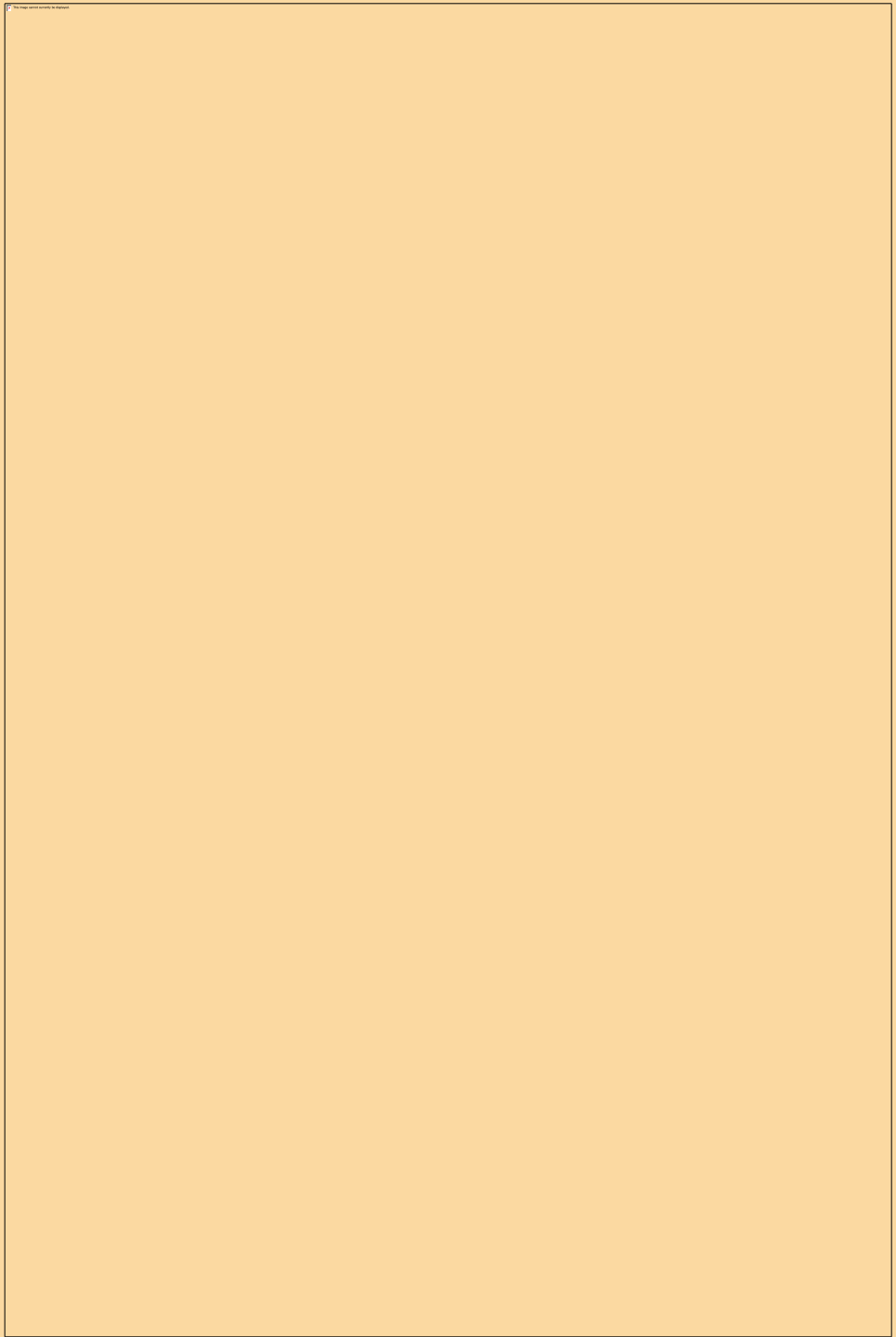
PREPARED FROM NATURALLY FERMENTED BATTER WITHOUT ADDITION AND FOOD ADDITIVE

MORE NUTRITIOUS AND TASTY

EASILY ADOPTABLE

COST EFFECTIVE AND PROFITABLE

INDIGENOUS METHOD OF PAPAD PREPARATION
'MUDDE HAPPALA'



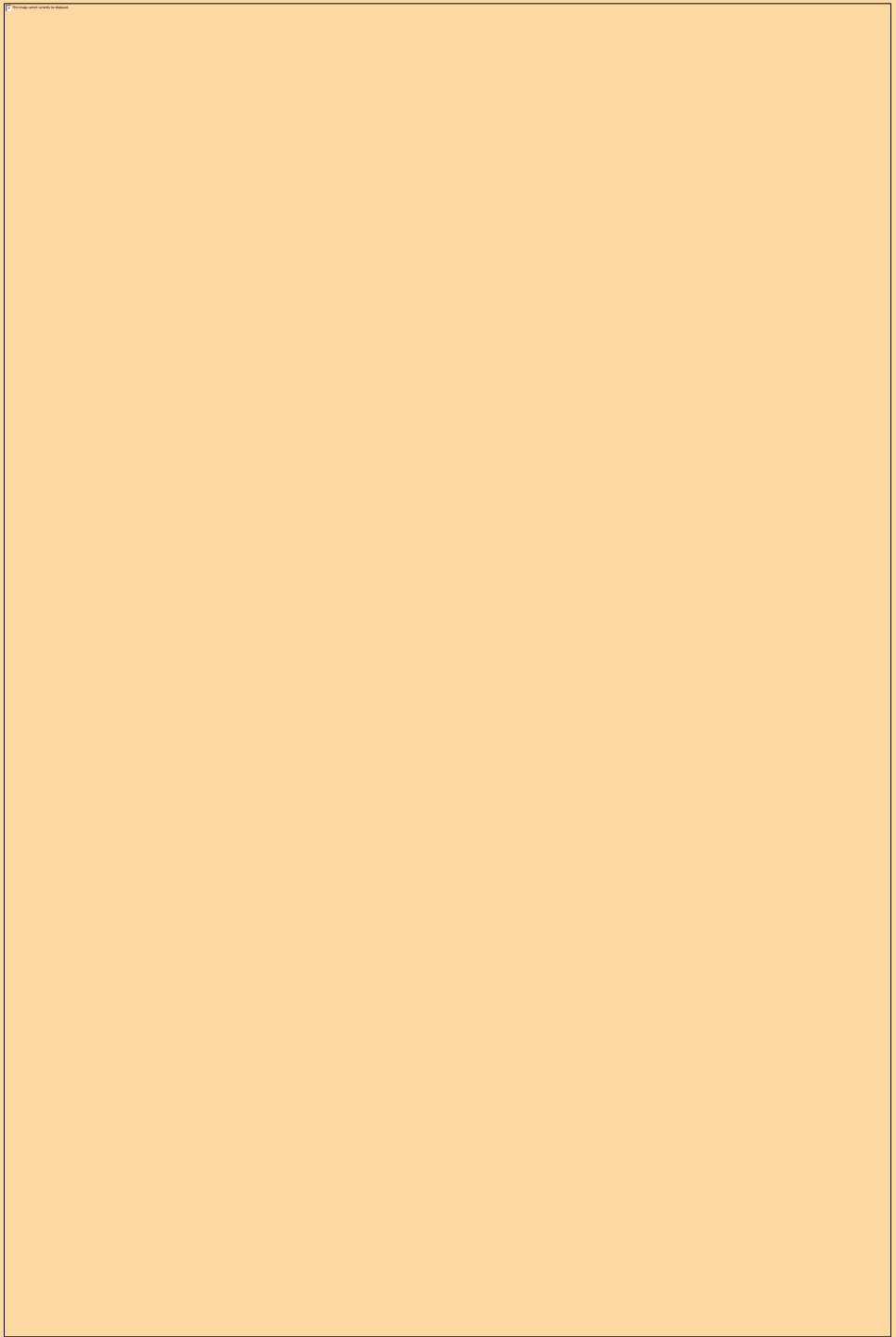
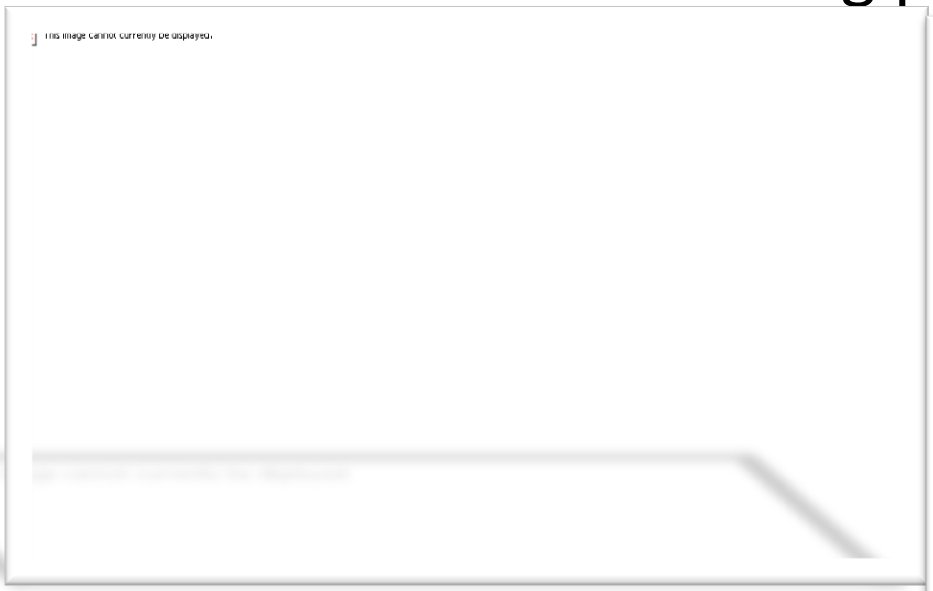


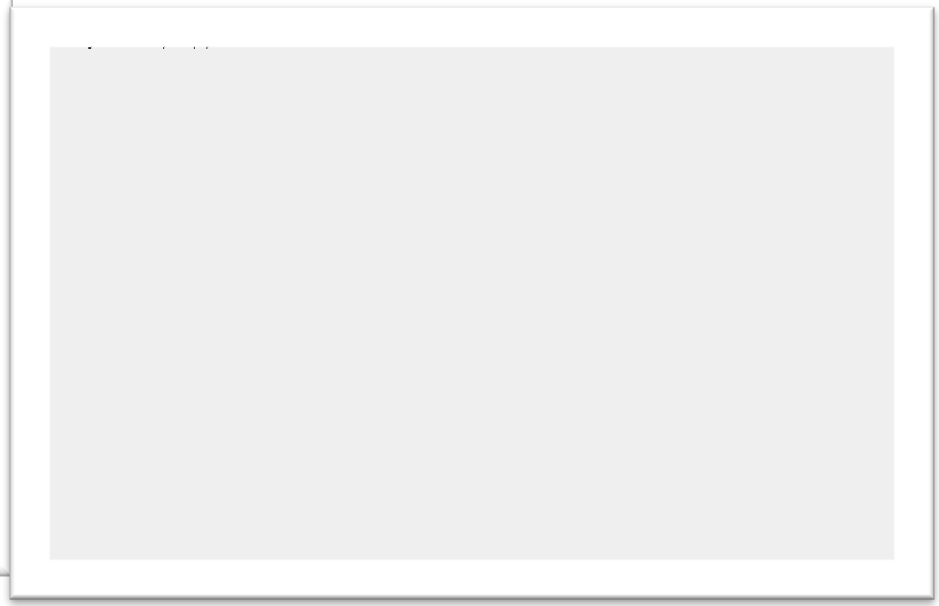
Table 2: Cost analysis of value added millet products (1 Kg)

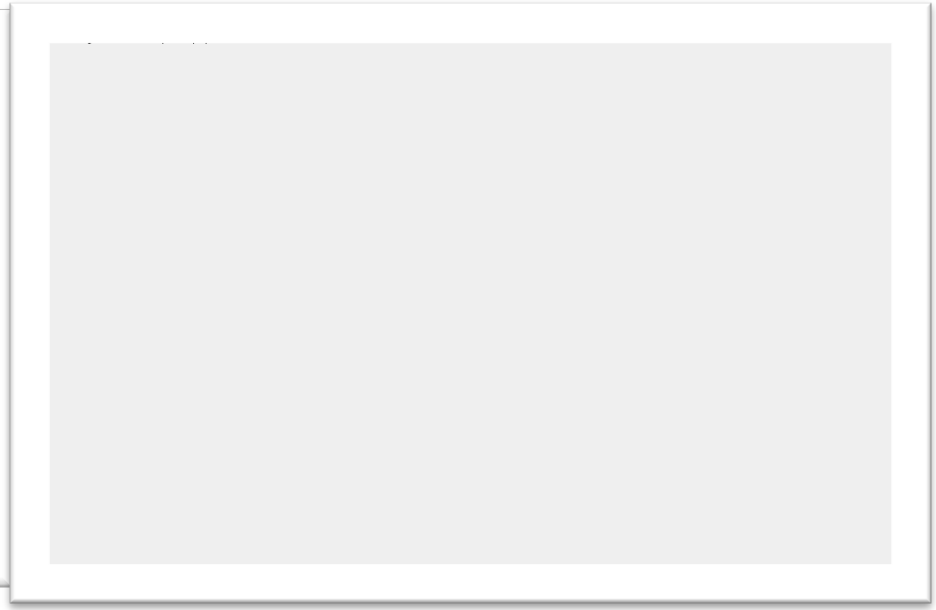
Sl. No	Name of the product	Cost of production/ kg (Rs)	Selling price/kg (Rs)	Profit margin (Rs)	% profit
1	Little millet Chakli	113	150	67	59%
2	Little millet Nippattu	131	150	64	49%
3	Hurakki Holige	143	200	57	40%
4	Navane Besan Laddu	336	200	84	25%
5	Millet Papad	95	150	55	58%
6	Little millet paddu	147	260 (26 plates)	113	56%

WOMEN CENTRIC FARM-TO-MARKET VALUE CHAIN OF LOCAL CROPS/MILLETS

Participation of Farm women/SHGs in value addition training programme







Certificate training on value addition to millets

	MSSRF Center	HESCO Center	UASD Center	Total
No. of trainings	02	01	02	05
No. of participants	34	20	23	77
No. of villages	07	04	03	14
No. SHGs	06	04	13	23
Millet	Finger millet Little millet Foxtail millet	Barnyard millet Amaranthus Finger millet	Little millet Finger millet Foxtail millet	

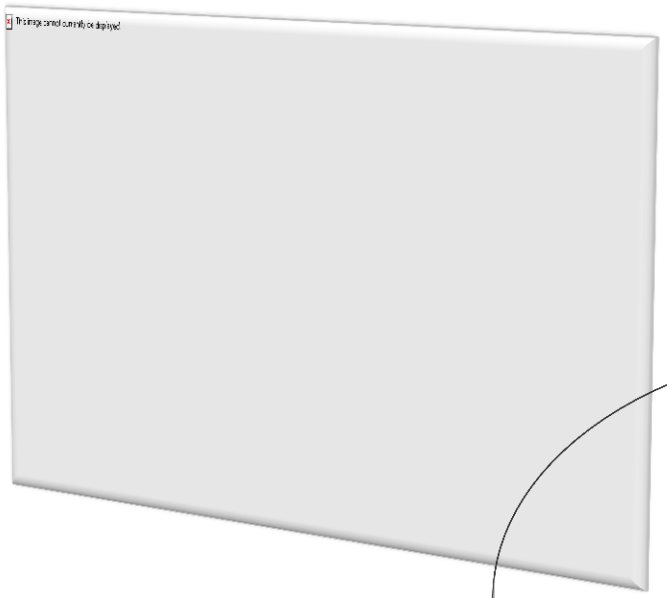
Topics included in the training

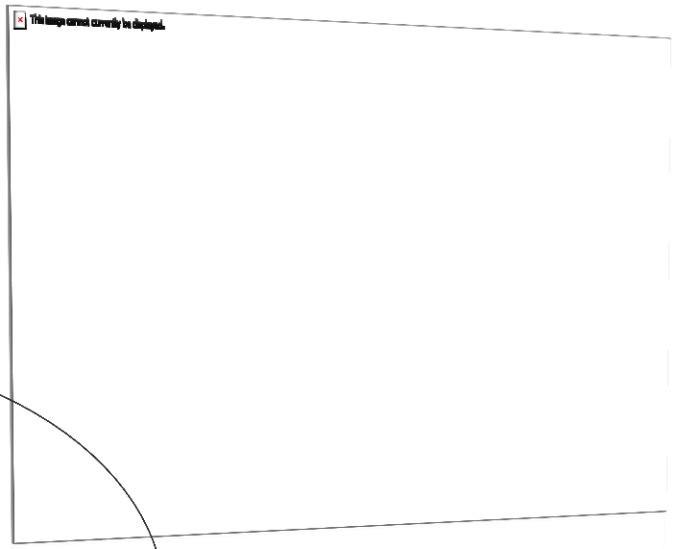
- Initial & final test on knowledge, attitude & practice on consumption of millets.
- Introduction, use and benefits of millet consumption.
- Demonstration of millet based foods for food & nutrition security.
- Millet based cookies & cakes for rural market.
- Commercial production of millet based products.
- Processing, hygiene & safety measures for commercialization of products.
- Packaging, labeling & cost estimation for commercialization of processed foods.
- Marketing of millet products.

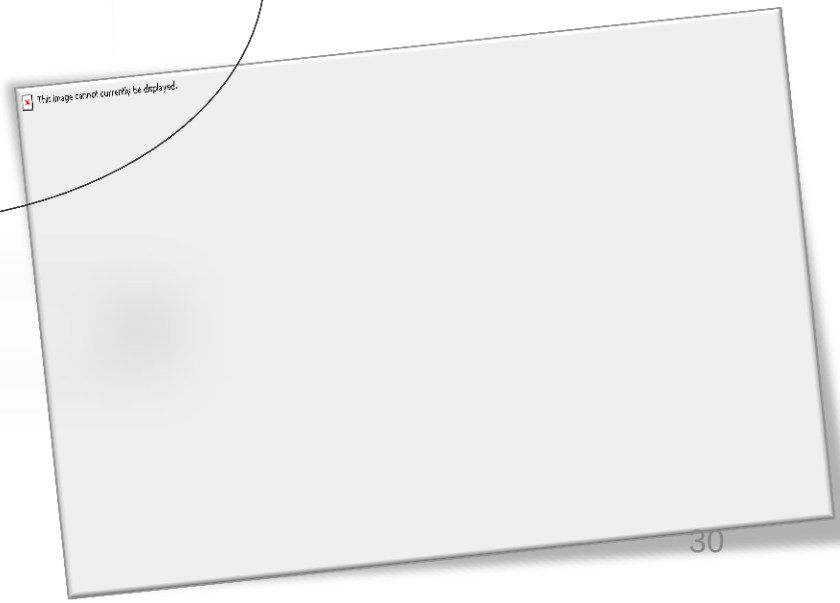
Mode of training

Sl. No.	Mode of training	Purpose
1.	Lecture with live samples	Create awareness
2.	Exhibition of live samples	Create awareness
3.	Demonstration of standard recipes	Maintenance of quality production
4.	Participatory demonstration	Exposure to large quantity cookery and selection of product for home-based industry.

Value addition training to MSSRF center







Certificate training on value addition to SHG members of Timmapur village

Participants at participatory demonstrations

Large scale preparation of Foxtail millet besan ladoo

Large scale preparation of little millet besan ladoo

Different products prepared by Trainees

Ragi malt drink

Foxtail millet besan ladoo

Little millet Idly

Little millet biscuit

Little millet khichadi

Little millet biscuit

Little millet dosa

Little millet roti

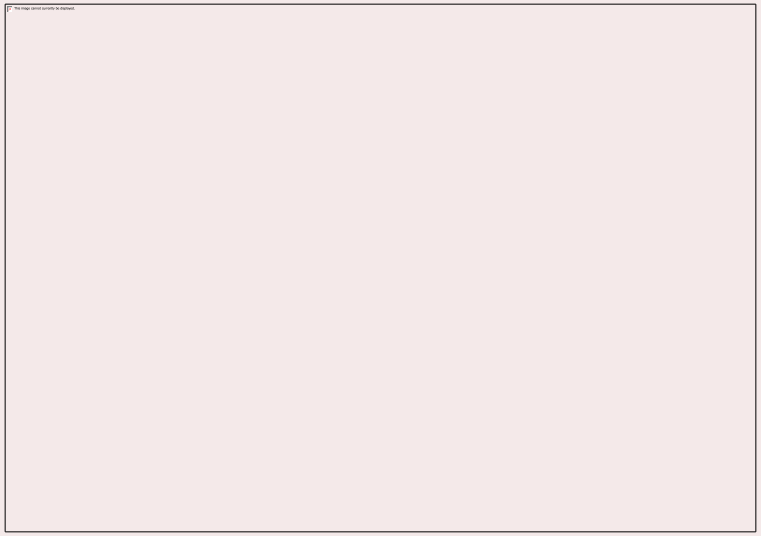
Ragi millet chakkuli

Little millet chakkuli

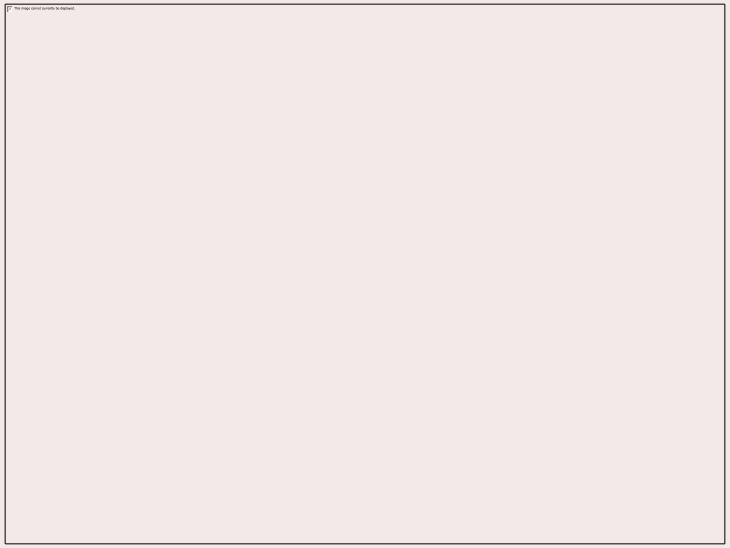
Ragi khara hurihittu

Little millet rice

Food processing unit at project villages



Inauguration of Food processing unit at Timmapur

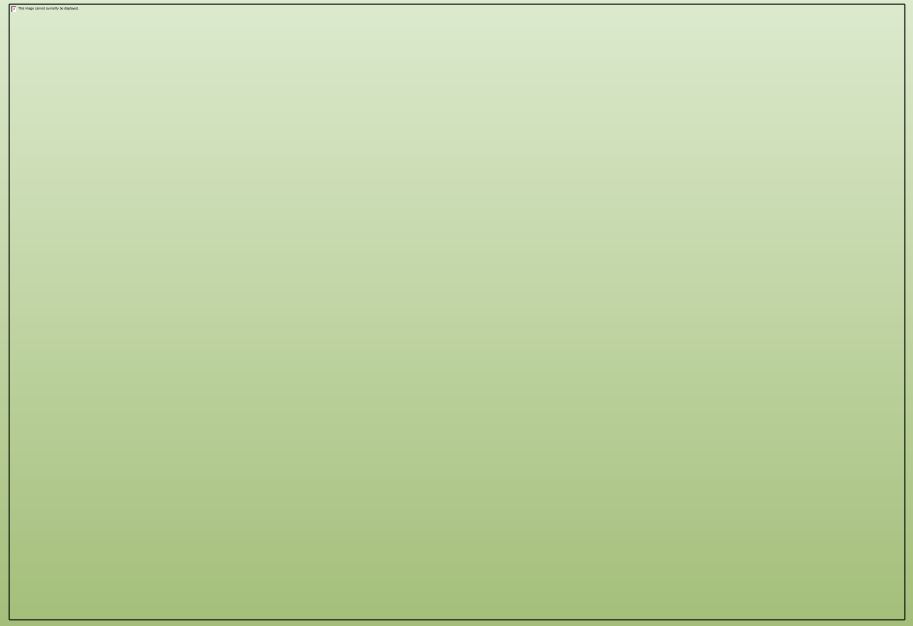


Food processing unit at Manthrodi

Active women enterpreneurs of Timmapur

SHG members of manthrodi village discussing on terms and condition to utilize food processing units

Millet products introduced to market under brand name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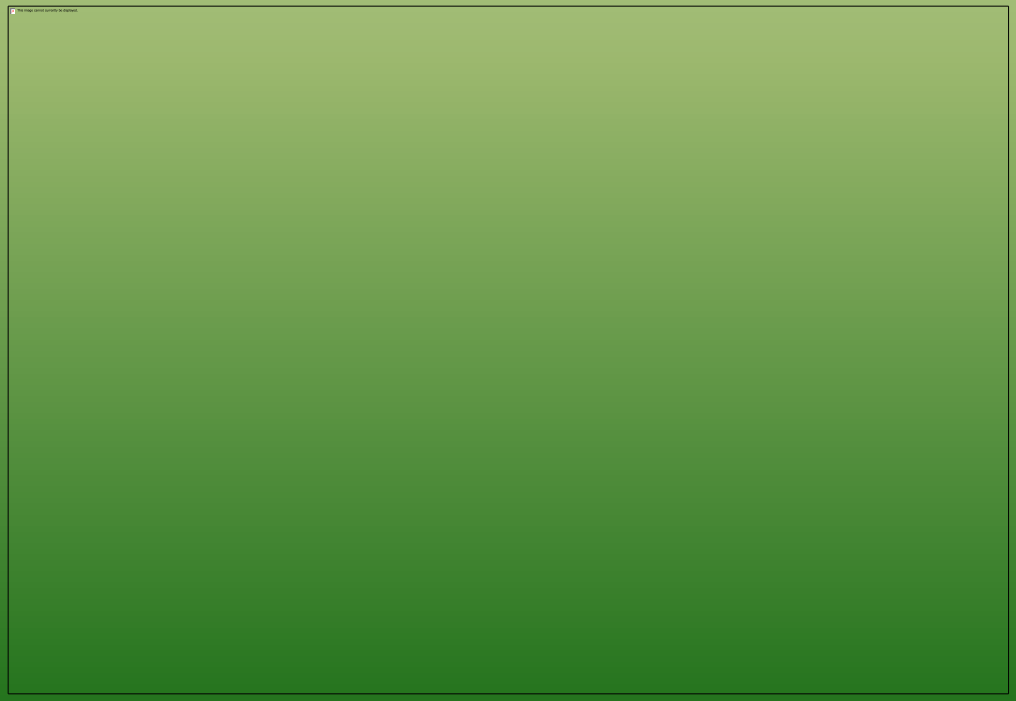
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Production, profit and employment generated

Sl. No	Particulars	UASD	Timmapur	Jekinkatti	Manthrodi	Total
1.	Total No. of women	02	07	03	02	14
2.	Total days of employment	36	33	13	9	67
3.	Total Production (Kg)	175	165	82	33	455
4.	Net Profit (Rs.)	12,187	9941	4632	1868	28628

Activities carried out by women members before starting enterprise n=8

Area	Activities	Frequency	Percentage %
House hold activities	All household activities	8	100
In the field	On the farm regular	2	25
	On the farm occasional /on demand	4	50
	Never	2	25

Resource management

Diversion of time from reproductive to productive* activity

Activities	Before (hrs)	After (hrs)	Hours of shift
Personal	1-1.5	1	0
Household	8-9	7-8	1
Leisure/ Entertainment	2- 3	1	1
Existing occupation if any	5-10	4 – 8	1
Sleep	8-10	6-7	2

CAPACITY BUILDING (N=47)

Sl. No.	Area	No. of women
1	Large scale production	37
2	Standard recipe production	37
3	Quality product for marketing/commercialization	10
4	Cost analysis of value added products for commercialization	05
5	Maintenance of Hygiene and cleanliness from procurement of raw ingredients to marketing of products	05
6	Batch wise preparation of products	16
7	Quality product for marketing/commercialization	05
8	Exposure visits on marketing	10

Technical empowerment

Sl. No.	Particulars	Frequency	Percentage %
1.	Awareness of new products	8	100
2.	New skills of value addition	8	100
3.	Realisation of nutritive value	8	100
4.	Entrepreneurship concept	8	100
5.	Avenue of value addition	8	100
6.	Other means of livelihood	2	25

Social empowerment

Sl. No.	Particulars	Frequency	Percentage %
1.	Visit to educational institutions	6	75
2.	Moving away from home for production work	4	50
3.	Capacity to procure quality raw materials and ingredients for both large scale and small scale	5	62.5
4.	Chance to participate in public/educational events (National workshops, exhibitions, melas etc)	6	75
5.	Negotiations with customers	5	62.5
6.	Marketing skills	7	87.5
7.	Self confidence	7	87.5

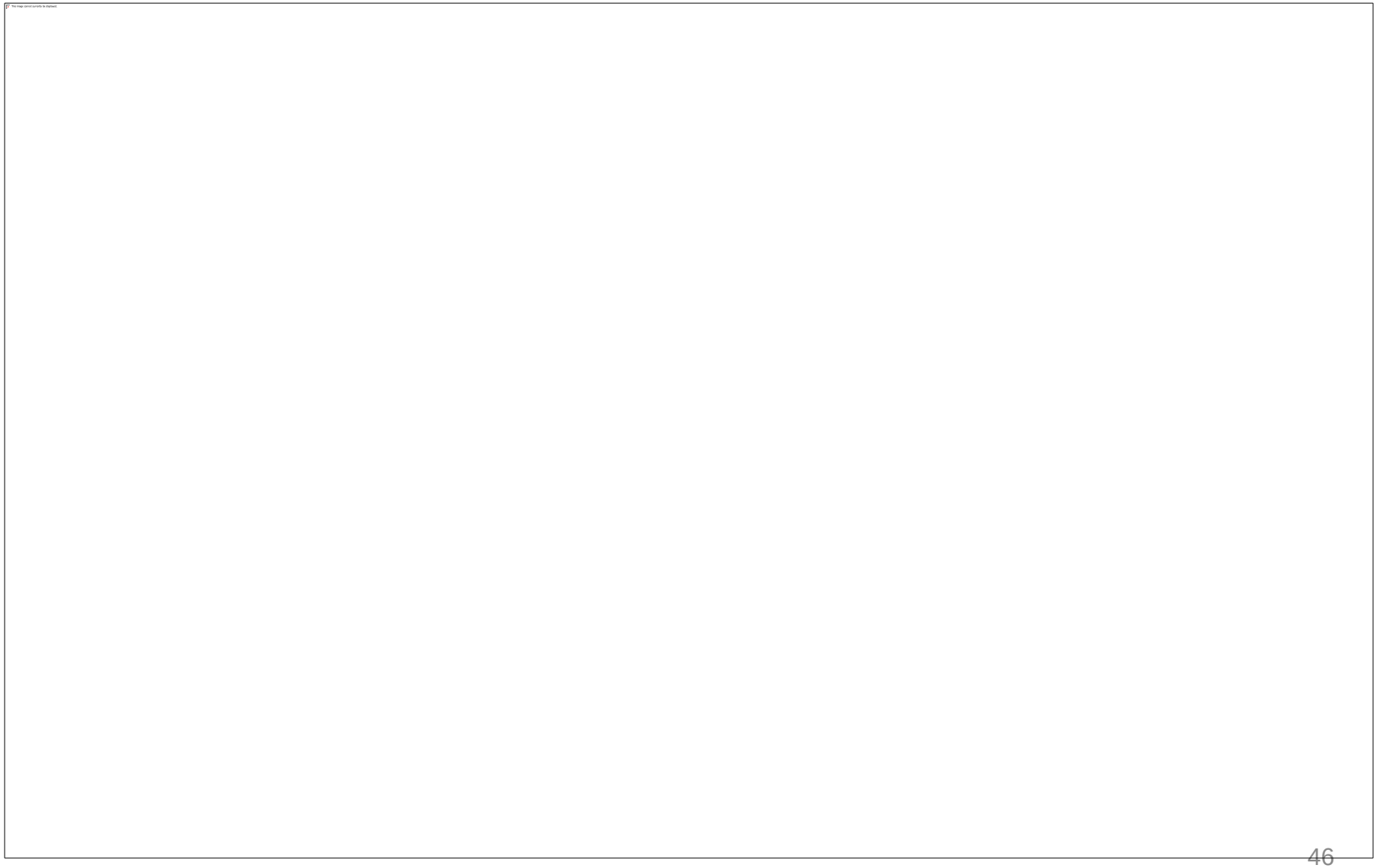
Economic empowerment

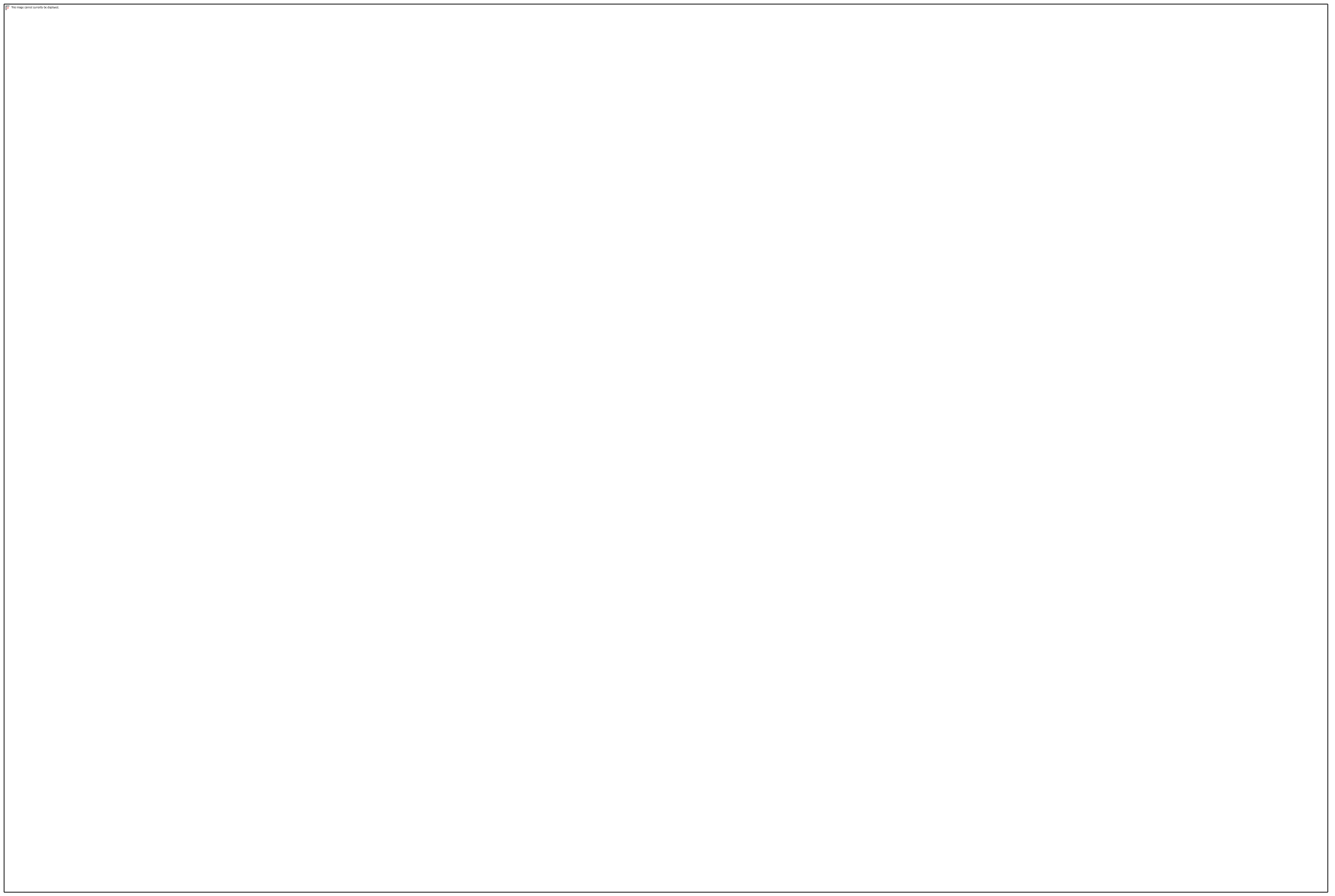
Sl. No.	Particulars	Frequency	Percentage %
1.	Additional income contributed to family	8	100
2.	Employment to the unemployed	2	25
3.	Access to income for personal / family expenditure	8	100
4.	Physical asset accumulation	5	62.5
5.	Savings with self/bank	7	87.5
6.	Confidence to face situations demanding small amount of finance	7	87.5

Utilization of income from value addition

Sl. No.	Activity	Purpose	Frequency	Percentage
1.	Purchased materials for self	Sangha sarees purchased	4	50%
2.	Household purchases	Utensils purchased, other family requirements met with	8	100%
3.	Re invested for the firm	Purchase of ingredients, containers	6	75%
5.	Children	Functions at schools, gifts	5	62.5%
6.	Savings	SHG, LIC	7	87.5%
7.	Retained with self	---	6	75%

Commercially viable millet product

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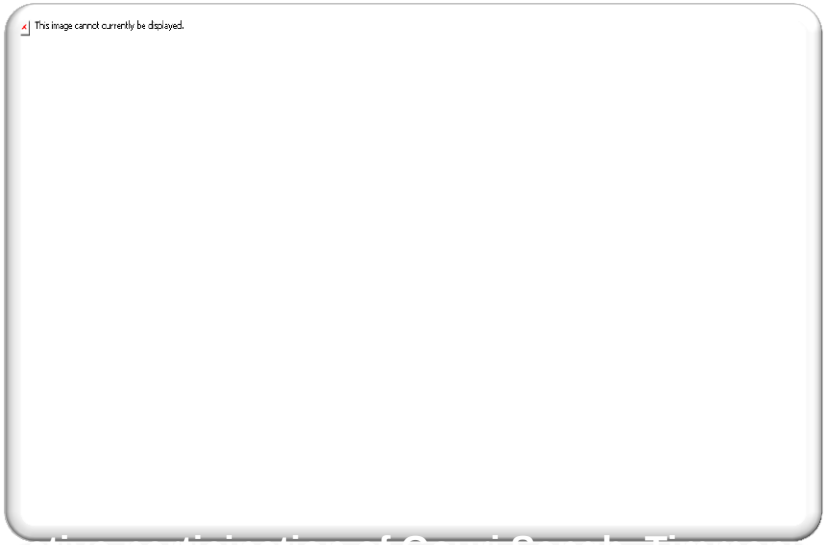
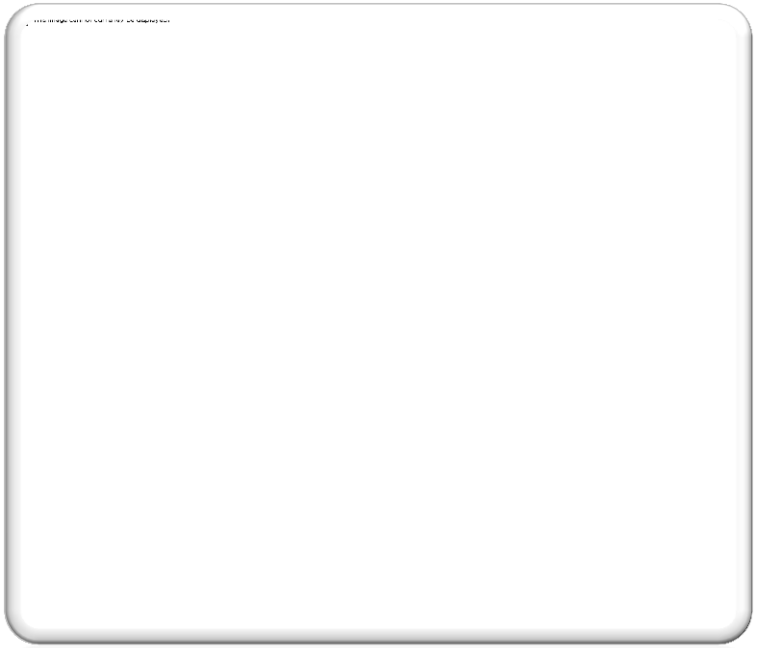
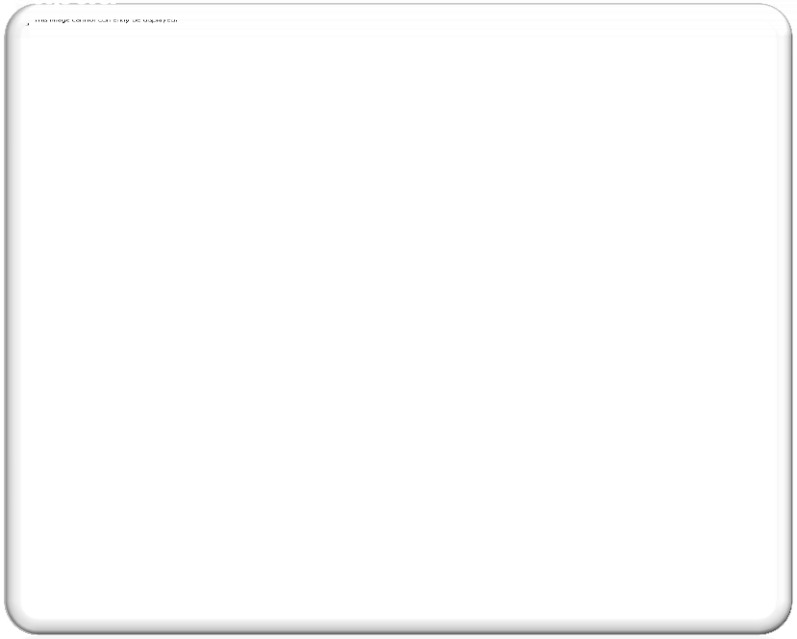
Total cost for 1 kg paddu and chutney preparation	**Rs. 82 .00**
Cost of labor (No of labor =1)	**Rs. 50.00**
Duration of preparation	**4 hr**
No of plates (per plate 5 paddu)	**25 plate**
Total expenditure	**Rs. 132.00**
Cost of selling (per plate Rs 10)	**Rs 250.00**
Profit	**Rs 118.00**

EXTENSION OF SUCCESSFULLY DEMOSTRATED WOMEN CENTRIC FARM TO MARKET VALUE CHAIN WITH VALUE ADDED PRODUCTS DEVELOPED FROM LOCAL CROPS FOR ENHANCING THE HOUSE HOLD INCOME THROUGH SELF HELP GROUPS

SHG involved in mass production of millet products





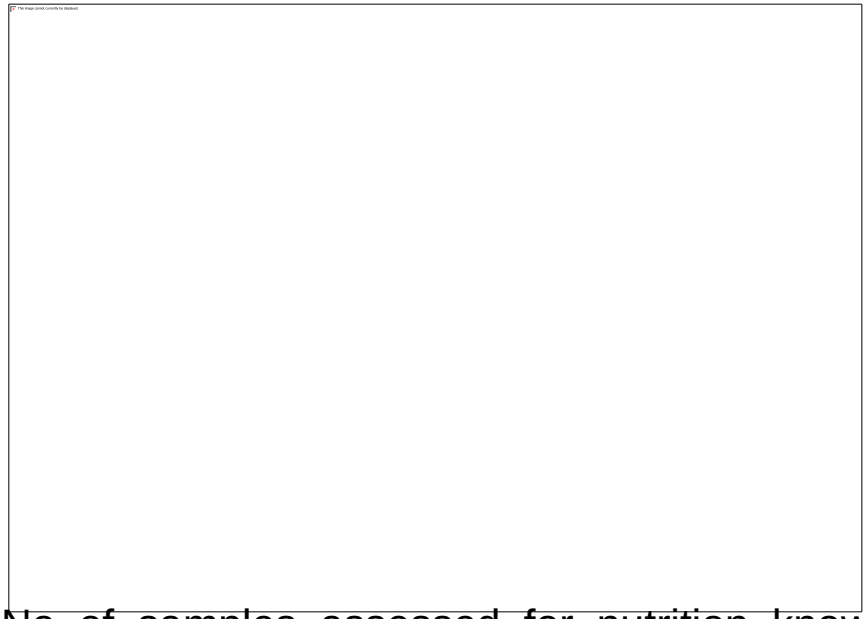


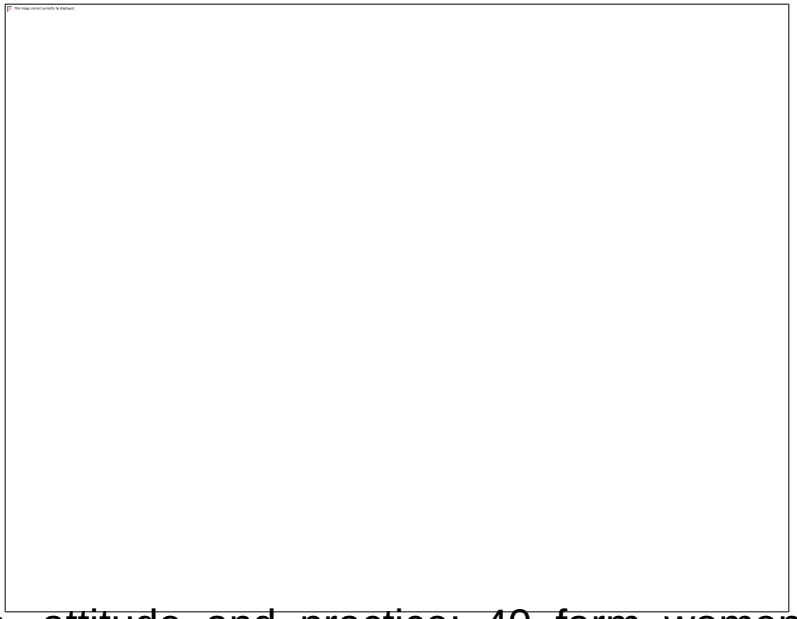
Active participation of SHGs of Gayatri Sangh in mass production of little millet papad-Jekkinkatti

Creation of employment opportunities in rural areas through food processing units

Nutrition Education Programmes On Consumption Of Local Staple Millets For Enhancing Food And Nutrition Security

PROMOTION OF HOUSEHOLD CONSUMPTION OF LOCAL NUTRITIOUS GRAINS THROGH NUTRITION EDUCATION FOR WOMEN, MEN AND CHILDREN IN IMPROVING THEIR HOUSEHOLD FOOD AND NUTRITIONAL SECURITY.





No of samples assessed for nutrition knowledge, attitude and practice: 40 farm women covering all the project villages

No of schools to be covered: 2, completed in 2 schools, Standard 8th and 9^{th,} No of children 100-120, No of women covered: 15 in Timmapur village

Education tools developed : Blowups, live models, booklet

Mode of education: exhibition, lecture and demonstrations, tasting of samples

Impact assessment: cooking competition, nutritional knowledge before and after and nutrition quiz for school children

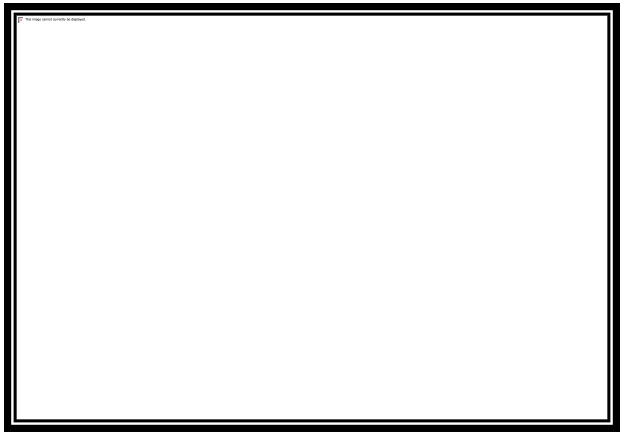
Emphasis of nutrition education: local crops/ balanced food /nutrition/ and food security

LESSION PLANS

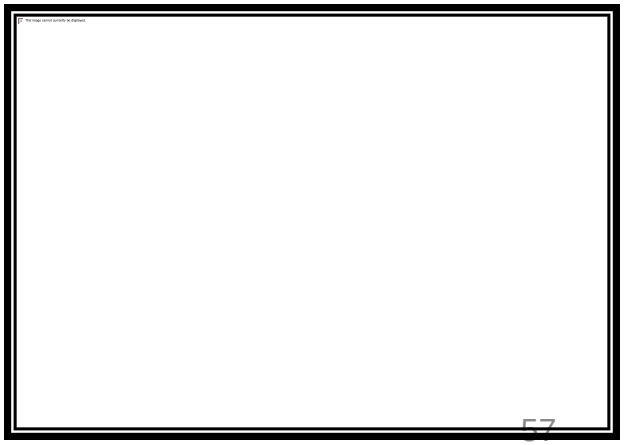
Sl No.	Areas	Mode of education
1	Importance of food and balanced diet,	Lecture with live models and blow ups
2	Nutritional scenario of indian population	Lecture with live models and blow ups
3	Nutritional significance of millets in comparison to other cereals	Lecture with live models and blow ups
4	Use of millet during fasting and its advantages (Little millet)	Lecture with live models and blow ups, sample tasting
5	Infant foods from millet (Finger millet)-Advantages	Lecture with live models and blow ups, sample tasting
6	Importance of breakfast and use of millets	Lecture with live models and blow ups, sample tasting

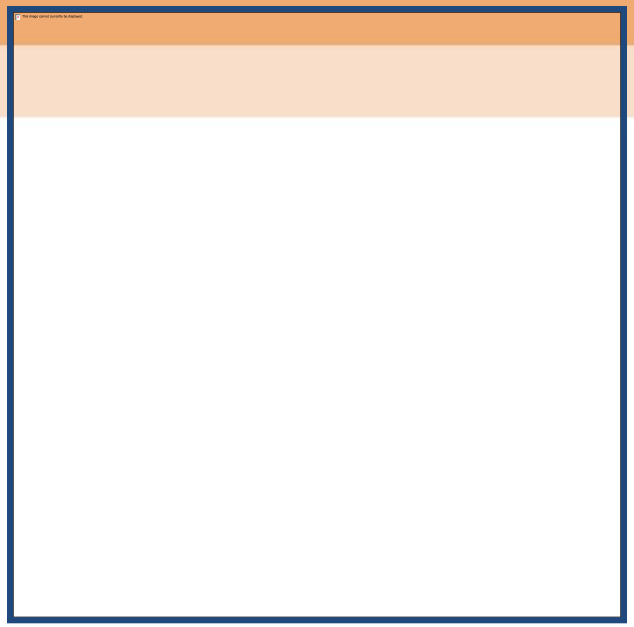
7	Traditional convenient millet foods	Lecture with live models and blow ups, sample tasting
8	Enhancement of nutritional quality of millets through processing	Lecture with live models and blow ups, sample tasting
9	Therapeutic value of millets and management of metabolic disorders	Lecture with live models and blow ups
10	Value added millet products: Bakery products, popped health food, energy rich food, low glycemic food	Lecture with live models and blow ups, sample tasting
11	Nutrition significance of millet foods prepared with associated crops	Lecture through Rangoli, live models and blow ups, sample tasting

Nutrition Education Materials



- Blow-ups
- Charts
- Booklet and
- Literature relating to nutritional and therapeutic value of millets





Mode of Education

- Lectures
- Demonstrations
- Essays
- Quiz Competition
- Distribution of booklets for reading
- Distribution of millet snacks for taste and acceptance

Conduct of Nutrition Education Quiz to School Children

SKVY Govt. High school Timmapur

Shri Dundi Basaveshwara High School Tadas

Govt. High School, Manthrodi

IMPACT OF NUTRITION EDUCATION

Fig:2 Form of consumption of millet

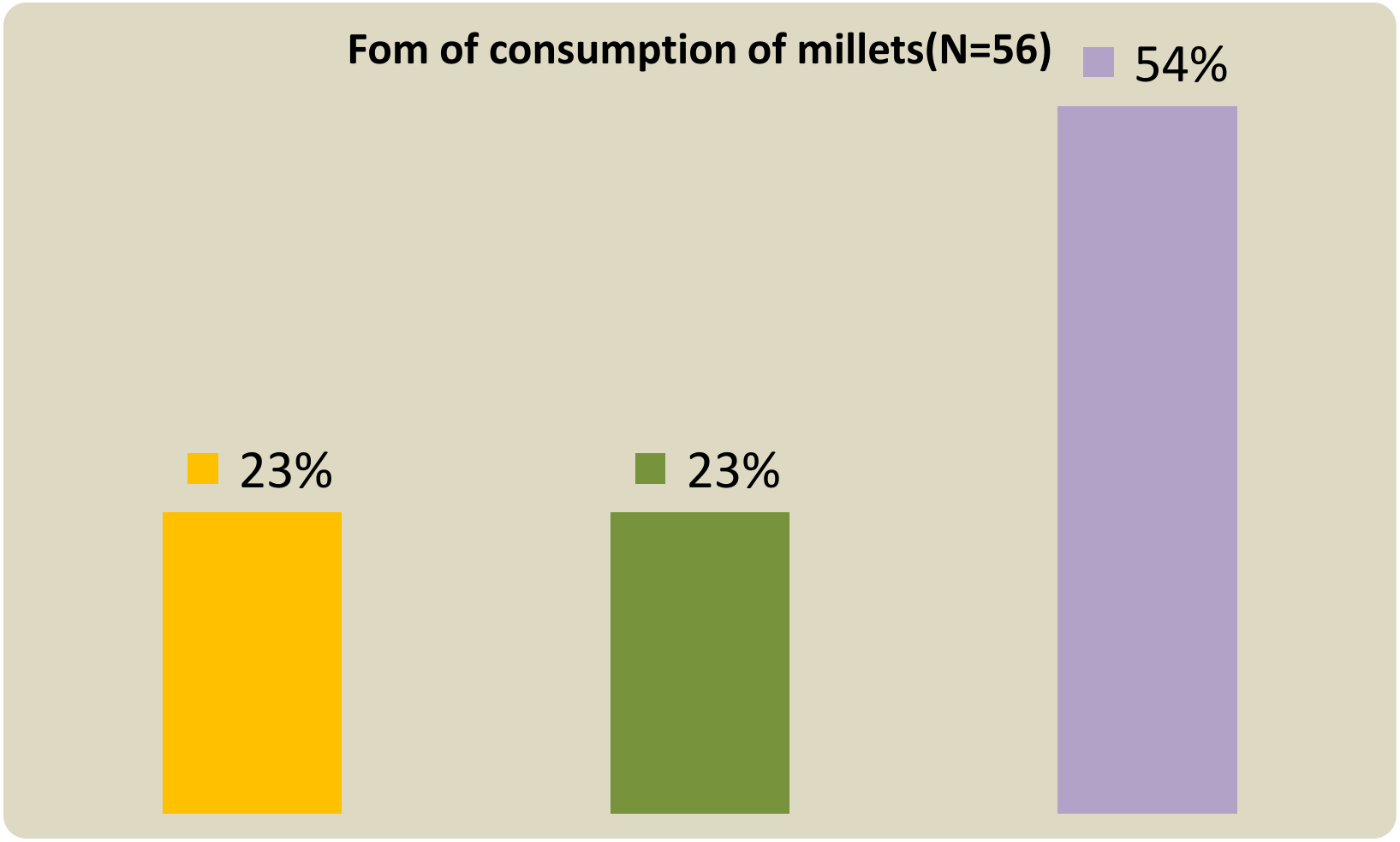
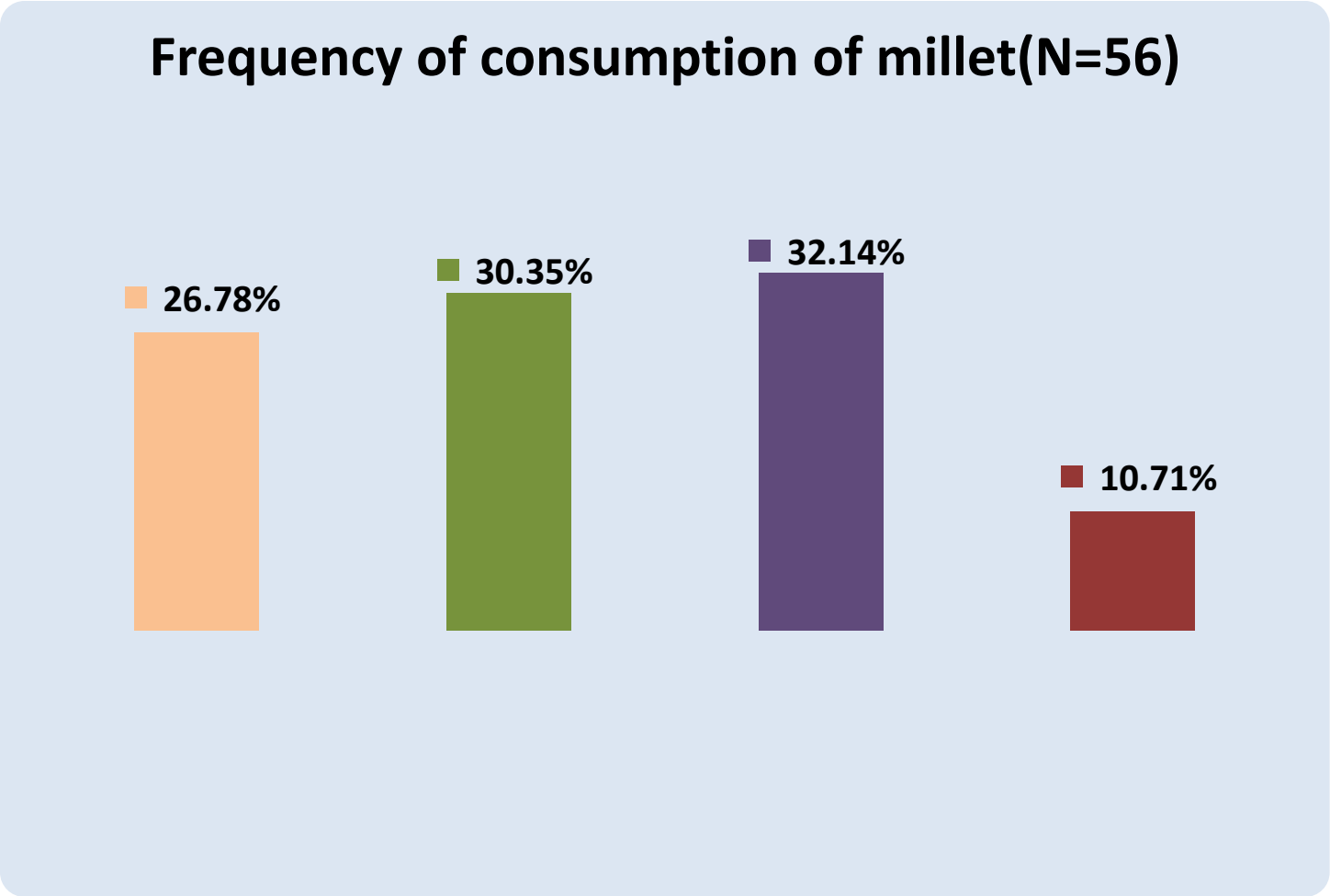
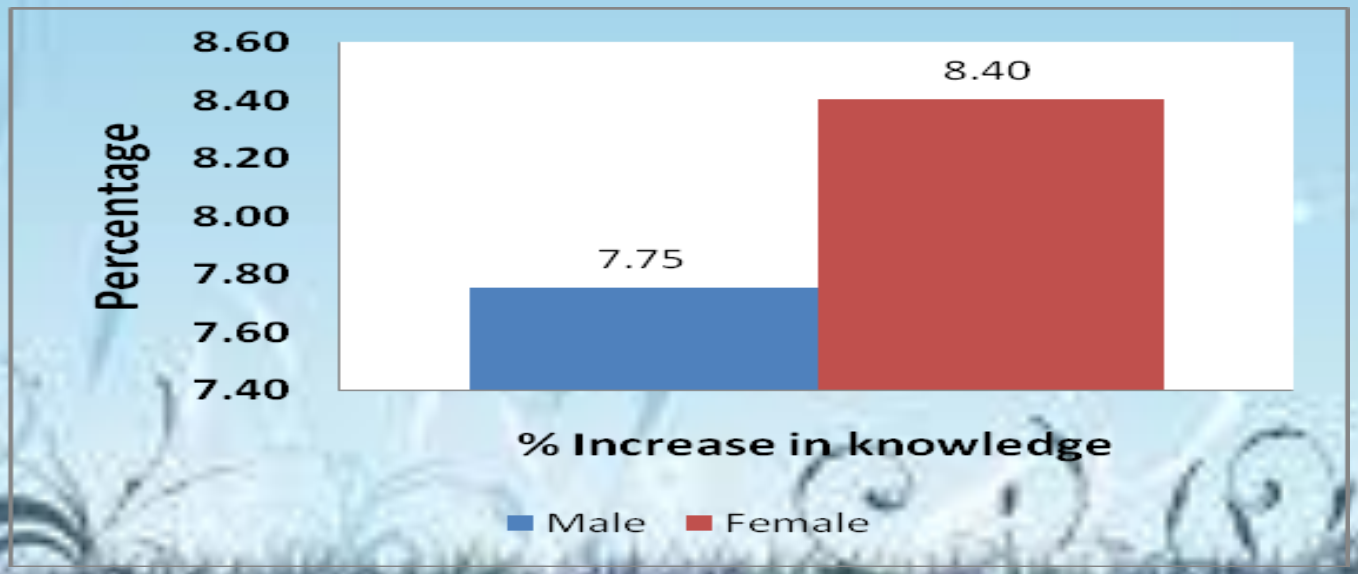


Fig:2 Frequency of consumption of millet



Impact of Nutrition Education on School Children of villages of Haveri district

Gender	N	Knowledge Scores		Percentage		% Increase in knowledge	T-value
		Initial	Final	Initial	Final		
Male	70	10.91	13.24	36.38	44.13	7.75%	-8.99**
Female	81	11.71	14.30	39.25	47.65	8.40%	



CONCLUSION

- Nutrition education had a positive impact on both knowledge and consumption of farm women and school children.
- 5-10% increase in the knowledge level of both school children and farm women
- Majority (69%) of the households are consuming millets especially in the form of value added products. The most consumed millet is finger millet i.e. in the form of ragi malt.
- Children were interested to have millet snacks and health drinks in school feeding programme and in regular meals.

Active women entrepreneurs in home based food industries

Champavati from Jekkina katti

- Champavati is a 50 year old widow who owns a petty canteen at Jekkinkatti .
- She had the responsibility of marrying off her 3 daughters for which she had to sell 3 acres of her land. Presently canteen is the only source of her income.
- Champavati was trained for Little Millet Chakkali preparation and now LM Chakkli has become an additional, most sought after snack in her canteen.
- Sale of LM Chakkli has fetched her an additional income of avg. Rs. 2000/- per month.

Shivaleela Hiremath -Timmapur

- Thirty two year old Shivaleela is an active member of Timmapur production team.
- Value addition under IDRC has provided her an additional part time job along with her tailoring activity.
- By value addition she has managed to earn Rs. 2800/- in 7 months.

Manjula Patil from Timmapur

- 27 year old Manjula is one of the 4 Timmapur women entrepreneurs involved in millet variety preparations such as LM Chakkli, LM Nippattu, FM Laddus, Hurekki Holige etc.
- Major portion of her family responsibility falls on Manjula and she is happy that IDRC project has given her a part time employment.
- Apart from her tailoring, Manjula has managed to earn around Rs. 2800/- in a period of 7 months by value addition

Santoshi - Jekkinkatti

- Santhoshi, an active member of Mallamma SHG, is good in documentation and village level management skills. She had also participated in the earlier CIDA funded millet project of UASD. Under the present project she was involved in little millet papad making activity.
- She lead a team of four members which was quite active and was able to produce and sell around 8,000 papads during a period of three months (April 2011 to June 2011). The team has also popularized millet papads in UASD by selling these papads to a number of staff in UASD.
- Her education and her capacity to actively involve herself in community based activities under the IDRC project has helped her to get an employment as Field co-ordinator in an NGO called Shri Kshetra Dharmasthala Rural Development Programme. The job fetches her a monthly remuneration of Rs.4,100/-.
- Presently she is popularising Little Millet Chakkli mix in her village.

FOOD SECURITY

- A compulsory keeping of 100g of ragi malt in every batch of preparation of ragi malt made the family consume ragi malt.

- Due to value addition activities and nutrition awareness programmes, consumption level of millet has been increased such as ragi malt, fermented products, millet snacks etc.

NUTRITION SECURITY

- SHG members involved in value addition activities have included ragi malt drink in their children's diet, hence improving the nutrition security.

- IDRC millet project activities in the villages have increased the consumption of millet, which is contributing to the improved nutrition security.

FUTURE CHALLENGE

- Driving factor to food industries is to create products of consumer's interest and needs with nutrition and health advantage

Challenge!!!!

- Addition of local grains in different food processing industries viz., Bakery, snacks, papad, pasta and health foods.
- Optimization of traditional processing methods technically and nutritionally.
- Mechanization of traditional foods and technologies. Suitable packaging technologies for better marketing. Designing of suitable machines for commercial exploitation.
- Making greater use of nutritious minor crops is a new approach that forges links between nutrition, health, conservation and biodiversity


Thank U……