Food-Safety Knowledge and Food-Handling Practices Among Indigenous Population



Contents

1	Executive Summary	5
2	Introduction (Context)	6
3	Food Safety in India: Opportunities and Challenges for India	7
3.1	Types of Food Safety Risks	9
3.2	Methodology	10
3.3	Sampling and study population	10
3.4	Data collection procedure and Study tools	.11
4	Results	12
4.1	Food Safety Knowledge	12
4.2	Indigenous Practices and Food Safety Aspects	.14
4.2.1	Harvesting related Practices and Food Safety	.14
4.2.2	Animal Husbandry related Practices and Food Safety	.16
4.2.3	Drying and Storage related Practices and Food Safety	.17
4.2.4	Cooking and Food Safety	18
5	Discussions and Conclusion	20
6	References	23

List of Figures

Figure 1 Supply Chain: Potential Sources of Food Safety Hazards (Buzby and Ewen.)	9
Figure 2 Age-wise composition of samples	10
Figure 3 Phasing of Study	12
Figure 4 Aspects of Food Handling Practices Covered under the study	14
Figure 5 Food Harvesting related safety practices and response from percent families	15
Figure 6 Food-safety Practices followed in the drying of food and vegetables	17
Figure 7 Storage related food safety practices using local material as a preservative	18
Figure 8 Food Safety Practices percent of families	19
Figure 9 Five Steps for "Growing Safer Food and Vegetables	22
Figure 10 The Way Forward for VAAGDHARA for "Food-Safe Indigenous Community	23

List of Tables

A RANKING

Table 1 Profile of study participants (N=600)	11
Table 2 Land Ownership Patterns.	11
Table 3 Samples distribution according to the number of animals	11
Table 4 Key Safety Questions and community response summary	13
Table 5 Attitude toward animal husbandry related - food handling practices % (n=600)	16
Table 6 Distribution of participants according to food handling and safety practices	19

Abbreviations

FBD	Food Borne Diseases
FSK	Food Safety Knowledge
FSP	Food Safety Practices
FAO	Food and Agriculture Organization
FSSAI	Food Safety and Standards Authority of India
ISO	International Standards Organization
OECD	The Organization for Economic Cooperation and Development
SDG	Sustainable Development Goal
UN	United Nations
VAAGDHARA	Voluntary Association of Agriculture General Development Health and
	Reconstruction Alliance
WHH	Welt Hunger Hilfe
WHO	World Health Organization

Preface

Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health. Consumption of unsafe food containing harmful bacteria, viruses, parasites, or chemical substances results in around 200 different diseases. The most common infection due to the consumption of insecure food is diarrhea, but it leads up to cancers. As per World Bank estimation, every year, 600 million (almost 1 in 10 people) in the world fall ill after eating contaminated food. It results in nearly 420000 deaths and the loss of 33 million healthy life years (DALYs).

Food safety, nutrition, and food security are closely linked. Unsafe food creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, the elderly, and the sick. In addition to contributing to food and nutrition security, a safe food supply also supports national economies, trade, and tourism, stimulating sustainable development. Banswara is one among the districts where communities are highly vulnerable on account of malnutrition and poor health status, particularly women and children. VAAGDHARA aims to enhance community capacity to prevent, detect, and respond to health threats associated with unsafe food. Therefore, we have tried to understand food handling related practices of tribal communities in the district of Banswara and their linkages with the overall food safety dimensions. Our interaction brought out many age-old traditions that are important for food safety, even in today's context. We have described them in this booklet so that more and more people can benefit from such best practices. In a short time, we could gather some essential practices, but there might be many more such practices, and we would request if you know are if you come across such practices, kindly share with us so that we can incorporate them in the future editions.

4

Thanks!

Jayesh Joshi Secretary, VAAGDHARA

1 Executive Summary

Background: Food-borne diseases (FBD) are illness caused by consuming contaminated food or drink. The contamination can occur anywhere from farm to plate and can lead to a variety of avoidable infectious diseases. The high prevalence of foodborne illness at home could be attributed to poor food hygiene and preparation due to poor awareness of proper practices. The objective of the study was to assess the knowledge and practice of food safety at home among the rural population in the Banswara district of Rajasthan state.

Methods: A cross-sectional study was conducted in the Banswara district with a sample size of 600 women members of Saksham Samuh, spread over in 30 villages (30 groups of 20 members each). A pretested semi-structured questionnaire was used to collect the data. The data generated mainly on community knowledge about the food safety aspect along with the data on a) harvesting related practices, b) animal husbandry related practices, c) food and crop drying and storage practices, and d) food preparation associated practices. Besides, the generation of these data teams also captured various indigenous methods and tried to capture community knowledge on the benefits of those practices about food safety aspects.

Results: There are multiple questions of four set discussed with 600 study samples; presents details of results. Still, in summary, we can find that there is a general lack of knowledge and behaviour on account of food-safety related practices. The situation about the knowledge regarding fundamental aspects of nutritive value getting diminished because of overcooking, learning about the proper methods of washing vegetables, linkages between food poisoning and food consumption practices is not very good. Though we followed, there are a good number of exercises among the indigenous communities, have direct linkage with food safety, but new generation women hardly able to explain the reasons behind.

Conclusions: Among the young women of indigenous communities in Banswara district, knowledge and practices leading to safe food consumption is limited and therefore there is need to undertake wider program on community awareness through systematic teaching regarding basic food safety guidelines is necessary to avoid many food-borne infectious diseases in rural areas.

2 Introduction (Context)

India is among the countries, who adopted "Right to Food" to its people and food quality and safety are essential aspects of the right to food. Food safety implies the absence or safe level of contamination, bacteria, naturally occurring toxins or any other substance that may make food harmful to health.

Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health. Unsafe food containing harmful bacteria, viruses, parasites, or chemical substances can cause more than 200 different diseases – ranging from diarrhoea to cancers. Around the world, on an estimation 600 million - almost 1 in 10 people – fall ill after eating contaminated food each year, resulting in 420 000 deaths and the loss of 33 million healthy life years (DALYs).

Food safety, nutrition. and food security are closely linked. Unsafe food creates a vicious cycle of disease and malnutrition, particularly affecting infants, young children, the elderly, and the sick. In addition to contributing to food and nutrition security, a safe food supply also supports national economies, trade, and tourism, stimulating sustainable

Right to Food in Indian Constitution

In the above mentioned Proceedings, the Commission has taken the view that the Right to Food is inherent to a life with dignity and Article 21 of the Constitution of India which guarantees a fundamental right to life and personal liberty should be read with Article 39(a) and 47 to understand the nature of the obligations of the State in order to ensure the effective realization of this right.Article 39(a) of the Constitution, enunciated as one of the Directive Principles, fundamental in the governance of the country, requires the State to direct its policies towards securing that all its citizens have the right to an adequate means of livelihood while Article 47 spells out the duty of the State to raise the level of nutrition and standard of living of its people as a primary responsibility. The Constitution thus makes the " Right to Food" a guaranteed Fundamental Right which is enforceable by virtue of the constitutional remedy provided under Article 32 of the Constitution.

development. The globalization of food trade, a growing world population, climate change and rapidly changing food systems have an impact on the safety of food. WHO aims to enhance at a global and country-level the capacity to prevent, detect, and respond to public health threats associated with unsafe food?

Food-borne diseases (FBD) are illnesses caused by consuming contaminated food or drink. The contamination can occur anywhere from farm to the plate. It can lead to a variety of avoidable diseases such as acute gastroenteritis, viral hepatitis. According to the Food and Agriculture Organization, access to safe and healthy food is one of the essential rights of a human being. However, this right to safe food is often compromised. As per the WHO report, more than 150 million people in the South East Asia region fall ill due to food-borne diseases, with a mortality rate of around 175 million.

Approximately 1/3 of these figures constitute children under five years. Many studies have shown that food-borne illness mostly affects the developing countries of the world, of which the Indian subcontinent had the highest incidence of acute diarrheal diseases. To reduce the morbidity and mortality relating to FBD, Food and Agriculture Organization (FAO) and World Health Organization (WHO) provides strict guidelines and regulations, for food processing, handling and consumption.

To emphasize the importance of food safety, the theme for World Health Day in 2015 was "From farm to plate, make food safe". The theme set out to educate the masses on food safety, new threats to food safety, food trends and preventive methods in order to strengthen food safety systems globally.In India Government has its own governing body of the Food Safety and Standards Authority of India (FSSAI), which also supervises food safety and provides regulatory standards for food production.In spite of many regulations and guidelines, the incidences of food-borne illness still continue to prevail. According to a nationwide study conducted, the prevalence of food-borne illness at the household level was 13.2%. Data from the same study also showed that 40% of the food poisoning cases occurred due to home-cooked food. The high prevalence of food-borne illness at home could be attributed to poor food hygiene and preparation due to poor awareness of proper practices. VAAGDHARA, a civil society organization, working with indigenous communities in remote regions focusing on improvement in UN-SDGs in such deprived regions and mainstream development for benefit of communities there. Considering this is has perceived this study on food safety, under its program supported by SWITCH-Asia and WHH on "promoting sustainable consumption and production systems for safe and organic food in India". The present study is being conducted to assess the awareness, knowledge and practice of food safety at home among rural populations in the Banswara district of Rajasthan state.

3 Food Safety in India: Opportunities and Challenges for India

Developing countries are paying increased attention to food safety, because of the growing recognition of its potential impact on public health food security, and trade competitiveness.

Increasing scientific understanding of the public health, consequences of unsafe food, amplified by the rapid global transmission of information regarding the public health threats associated with foodborne and zoonotic diseases (e.g. E. coli and salmonella, bovine-spongiform encephalopathy (BSE), severe acute respiratory syndrome (SARs) and H5N1 avian flu) through various forms of media and the internet has heightened consumer awareness about food safety risks to new levels globally (Lindsay 1997, Unnevehr 2003, Buzby and Unnevehr 2003, Kafersteing 2003, Ewen et al. 2006, Bramhmbatt 2005).

Increased understanding of the impact of mycotoxins, which can contaminate dietary staples such as wheat, maize, barley and peanuts, has further raised food security and public health concerns in many developing countries (Dohlman 2003, Bhat and Vasanthi 2003, Unnevehr 2003).

As developing countries seek to expand agricultural exports especially to OECD countries, many are receiving a wake-up call on the challenges of meeting both government andprivate sanitary and phytosanitary (SPS) standards in export markets (Otsuki et al. 2001,Henson 2003, Unnevehr 2003, World Bank 2005a). Private standards or supplier protocols have grown in prominence over the past decade as a means to further ensure compliance with official regulations, to fill perceived gaps in such regulations, and/or to facilitate the differentiation of company or industry products from those of competitors. Trends in private standards increasingly tend to blend food safety and quality management concerns (i.e. the recent creation of ISO 22000) or to have protocols which combine food safety, environmental, and social (child-labor, labor conditions, animal welfare) parameters (Willems et al. 2005, World Bank 2005). At the same time, increasing globalization of trade introduces greater risks of cross-border transfer of food-borne illnesses. Recent cases of disease episodes in the United States resulting from imported food products, such as cyclospora from raspberries, hepatitis A from strawberries and salmonella from cantaloupe (Calvin 2003), illustrate to developing countries the potential food safety challenges that can arise in a more globalized market.

Weaknesses in food safety systems can have a high cost to society and the global economy. The World Health Organization (WHO) estimates that 2.2 million people worldwide die from diarrheal diseases caused by a host of bacterial, viral and parasitic organisms, which are spread by contaminated water (WHO 2006a). In India, it is estimated that 20% of deaths among children under five are caused by diarrheal disease (WHO 2006b). The SARs outbreak in 2003 in East Asia is estimated to have caused an immediate economic loss of about 2% of the Region's GDP in the second quarter of that year, even though only 800 people died from the disease (Brahmbatt 2005).1 The Lowy Institute for International Policy (2006) estimates that a mild global outbreak of the avian flu can cost the world 1.4 million lives and close to 0.8% of GDP (US\$330 billion) in lost economic output. At the same time, country reactions to protect its citizens from food safety risks can also have large consequences for exporting countries. Otsuki et al (2001) examined the projected impact of the EU's new harmonized aflatoxin standard on the value of trade flows to 15 European countries from 9 African countries and found that it could decrease African exports by 64% (US\$670 million).

Food safety concerns are getting widespread attention in India. The country's ruraldevelopment strategy for which, a key element is the promotion of increased agricultural exports as a means to foster rural growth and poverty reduction, is coming up

against tightening food safety and SPS standards in prospective markets (World Bank 2006a, 2006b). From a domestic perspective, the large national market of 1.2 billion people is undergoing rapid change. Increasing incomes, a growing middle class, increased urbanization and literacy, and a population highly tuned to international trends fuelled by the information technology boom are creating a large consumer base giving increased value to food quality and safety. Improving food safety systems, to meet domestic and export requirements, however, face a number of policies, regulatory, infrastructural and institutional obstacles.

(8)

This study aimed to "review the main drivers for the increased priority to addressingfood safety risks among the indigenous community in Banswara district" and identify steps to improve community behaviour pertaining to food safety challenges, with specialfocus on traditional livelihood options of agriculture and allied occupations. Also, explore potential key areas of interventions to improve food handling behaviour through community actions on food safety so as to achieve the project objective

3.1 Types of Food Safety Risks

Food safety risks, as they relate to human health, arise from a number of factors. These include (i) microbial pathogens (bacteria, viruses, parasites, fungi and their toxins); (ii) pesticideresidues, food additives, livestock drugs and growth hormones; (iii) environmental toxins such asheavy metals (e.g. lead and mercury); (iv) persistent organic pollutants (e.g. dioxins); and (v)zoonotic diseases (e.g. BSE, SARS, Avian flu, Japanese encephalitis, tuberculosis) (Buzby and Unnevehr 2003, Ewen et al. 2004).2



Figure 1 Supply Chain: Potential Sources of Food Safety Hazards (Buzby and Ewen.)

The health risks associated with these agents impact the whole food supply chain, starting from the input supply to the farm to the consumer table (Figure 1). The samples included in this study are mainly associated with agriculture input supply, farming, partial value addition, and consumption. The figure also shares about the normal practices that can be causes of food safety hazards for their own

consumptions, as presently they are not involved in market value-chain. The persistent habits may later in the market value chain lead to food safety hazards, which are the target of the project under SWITCH-Asia support.

3.2 Methodology

In the present study, data were obtained mainly through primary sources i.e. use of a questionnaire that was designed considering FASAI guide note on food safety and food quality. Personal interviews and direct observation during site visits were carried out to obtain additional information on specific areas that the questionnaire instrument did not cover.

3.3 Sampling and study population

The study population comprised of 600 women of 30 Saksham Samuh, from five blocks of Banswara and Pratapgarh districts of Rajasthan, simple random sampling was used. Houses in the village were enumerated and participants were enrolled as group members of the Saksham Samuh in five blocks of Banswara district and covered a period of three months duration i.e. from August 2019 to December 2019.



Figure 2 Supply Chain: Potential Sources of Food Safety Hazards (Buzby and Ewen.)

(10)

Table 1 Profile of study participants Age Wise (N=600)

	Ghatol	Gangad Talai	Anandpuri	Kushalgarh	Sajjangarh	Total
< 25 Years	5	11	13	3	11	43
26-35 Years	63	47	40	36	64	250
36-45 Years	36	35	35	48	37	191
46-55 Years	14	13	27	32	7	93
> 56	2	14	5	1	1	23
Total	120	120	120	120	120	600

Table 2 Profile of study participants Land Holding (N=600)

	Ghatol	Gangad Talai	Anandpuri	Kushalga r h	Sajjangarh	Total
< 2 Acre	68	18	5	35	46	172
2 to 4 Acre	22	52	41	55	63	233
4 -6 Acre	26	39	43	24	10	142
6-8 Acre	4	9	18	6	1	38
> 8	0	2	13	0	0	15
Total	120	120	120	120	120	600

Table 3 Samples distribution according to the number of animals

	Ghatol	Gangad-Talai	Anandpuri	Kushalgarh	Sajjangarh	Total
0-5	84	74	65	64	89	376
6-10	32	41	50	52	30	205
11-15	3	3	3	4	1	14
16-20	1	2	2	0	0	5
Total	120	120	120	120	120	600

3.4 Data collection procedure and Study tools

After obtaining written informed consent, the participants were interviewed using a pretested questionnaire by development volunteers in the local language i.e. Hindi.

The study instrument comprises of five sections. Section 1 comprises of Socio-demographic details such as age, sex, education, occupation, marital status, socioeconomic status (modified BG Prasad classification). Section 2 comprises of knowledge on food handling practices. Section 3 includes attitude towards food practices like washing of vegetables, eating of raw vegetables, etc. and attitude towards food poisoning. Section 4 includes questionnaires regarding food hygiene practices at home like food habits, method of cooking of milk products, hand washing practices, methods used to clean vegetables/fruits, storage of cooked food items. Section 5 includes questionnaires related to agriculture, harvesting, drying, storing and animal husbandry related practices, such that they are able to recognize cleanliness and potential threats of food contamination.



Figure 3 Phasing of Study

4 Results

The study covered two critical aspects one is knowledge about the food safety and practices associated with livelihood actions, and food handling actions which are followed in day to day life. The data generated with 600 women members of 30 groups is quite useful to develop VAAGDHARA's strategy for including Food-safety as one of the key intervention areas to address the issue of malnutrition in its operational area.

4.1 Food Safety Knowledge

Totally 600 women participants were studied. A majority (74%) of the study participants were between 26-45 years of age. On assessing the knowledge of food safety, around 74% had no knowledge about overcooking. 60% said that reheating food is not harmful and 55% did not know that food that is not freshly prepared could cause food poisoning (Table 4).

Table 4 Key Safety Questions and community response summary

SI No	Key Safety Que	stions ar	nd comm	unity resp	onse
FSK_01	Milk Should be consumed after boiling or raw	57% Aft(er boiling	43% N	ot specific
FSK_02	Vegetable cleaning should be done	42.5% After cutting	12.3% Before Cutting	45.2% Deep	ening in Water
FSK_03	Chhachh should be consumed	10% Every- time	16.8% Frequently	16.7% Never	56.7% Occasionally
FSK_04	The vegetable can be purchased/plucked	8.2% Daily	19.8% Twice a week	15.8% Weekly once	56.2% As and when required
FSK_05	Have Separate Kitchen	94% Yes		6% No	
FSK_06	Flies in the Kitchen	62% Yes		38% No Attention	
FSK_07	Rodents in the Kitchen	100%	No Attention		
FSK_08	Storage of Cooked food in Closed Containers	100%-Yes			
FSK_09	Overcooking diminishes the nutritive value	32%-Do	n't Know	26%-Yes	42%-No
FSK_10	Reheating of food is	15% - Don't Know	35% -Harmful	60% - Unharmful	
	Correct mathed of weaking	22% -	18% -		60% - Wiping
FSK_11	vogeteblee is	After	Before		with
	vegetables is	cutting	Cutting		towel/cloth
	Consuming food which is	17.5%		20% Not	
FSK_12	not freshly prepared causes	Don't Know	17.5% No	Necessarily	45% Yes
		KIIOW			

4.2 Indigenous Practices and Food Safety Aspects

In order to understand food safety-related handling of indigenous community study covered four aspects of day to day livelihood actions as shown in figure-4, the questions generated based on the general discussion and practices that were reflected in a booklet "community practices for food, a publication by VAAGDHARA.



Figure 4 Aspects of Food Handling Practices Covered under the study

4.2.1 Harvesting related Practices and Food Safety

Under this sub-section study focused on two aspects 1) capturing practices related to harvesting and cleanliness aspects through six key questions and 2) discussion with regards to traditional practices and food safety aspects associated with them.

There were many processing practices among the indigenous community, which were following the practices which go in-line with the five steps promoted by WHO as a must for food safety. As most of the regions where indigenous communities live is mainly tropical, thus temperature range during most of the days (nearly 300) favoursthe growth of micro-organisms and thus resulting in spoilage of food and food-items.

This was perhaps recognized by these communities and that could be the reason why in this region majority families adopted to sun-drying of food items to bring moisture levels before storage. We tried to capture community perception regarding this and could find the following points which are important from the angle of food safety. The discussion also brought out that though people could not name the seasons, but some of their practices are unique and associated with food safety.

(14)



Figure 5 Food Harvesting related safety practices and response from percent families

- Mostly grain-crops harvested will be harvested with cover or fruit itself and dried it with cover, as a community believes that raw-grain are more susceptible to contamination. For examples;
- Maize harvested, from the field will not be takenout of the cobs, rather it will be dried directly under the sun, by keeping on a roof or some highest, which is airy.
- Wheat, Gram,
- Sesame, Poppy-grains, Mustard, groundnuts, have a tendency to spoiled, thus are not taken out from their cover, rather stored with cover for long-life.
- Among indigenous farmers, thrashing has always been a place of importance particularly from the angle of "food-safety". Every time before harvesting, preparation of the thrashing floor" was considered a major activity. Just before starting the harvesting, the thrashing floor will be cleaned with a mix of cow-dung, cow-urine and water.
- Selection of site for thrashing floors was given utmost importance, it should be on the utmost possible height, away from shed or plants, little away from day-to-day activities and reach of children so that no contaminations affect the process.
- A person involved in thrashing should first bath, wash his/her hands and legs before entering Khaiyaan (Threshing Floor).
- People who were having diseases and women who were in their mensural-periods were not allowed to work in thrashing.

(15)







Drying of Wheat

4.2.2 Animal Husbandry related Practices and Food Safety

This sub-section of the study also focused on two aspects 1) capturing practices related to handling animal husbandry particularly cleanliness as given in table-6, the data thus generated gives practices followed by representatives of the indigenous community.

Table 5 Attitude toward animal husbandry related - food handling practices % (n=600)

	Cleaning of Animals	Cleaning of Cattle house	Cleaning of a cattle trough	Health check-up of animals	A bucket is washed with clean water before milking	Hands are washed with clean water before milking	Teats of animal are cleaned before milking	Animal Bathing
Daily	11.67							
Fortnightly	24.00	22.33	0.00					30.33
Once in a week	20.00	44.00	21.33					42.00
Twice a week	20.17	33.67	38.67					27.67
Monthly	24.17							
Quarterly				17.83				
Twice a year				25.67				
Unlesssick				30.83				
Not often				25.67			10.33	
Sometimes						42.67	12.17	
Most times					54.50	57.33	52.50	
Always					45.50		25.00	

(16)



Turmeric Drying

Wooden Oil-Press for Mahua Oil Spice-Grinding Tool Drying of Mahua petals

4.2.3 Drying and Storage related Practices and Food Safety

This sub-section of the study also focused on two aspects 1) capturing practices related to drying of vegetables as shown in figure-6, and 2) aspects of food safety-related practices while storing the food grains for a longer duration (Figure-7). The questions were mainly based on earlier focus group discussions. Some other practices are reflected by the community as listed for further reference.



Figure 6 Food-safety Practices followed in the drying of food and vegetables

(17)



Figure 7 Storage related food safety practices using local material as a preservative

4.2.4 Cooking and Food Safety

- Among households, the most common point where food can get contaminated is that of preparation or cooking. In traditional houses, the responsibility of cooking and feeding lies with a woman. Thus, their knowledge and practice are most important for food safety at the household level. Considering this critical connection, a list of common behaviour and practice related questions were executed to understand their perception and actions. Table -6 gives details of findings pertaining to these practices.
- In the present study, only 35.2% of women indicated adequate knowledge about overcooking, reheating, washing vegetables and consuming fresh foods altogether. When considered separately almost 50.5% had the knowledge that overcooking could diminish the nutritive value of the food. In the present study, 28.7% did not have knowledge regarding the relationship between overcooking and nutritive value.
- 34% of women have not indicated satisfactory practices in keeping the leftover food items and their storage actions.
- Only 35% knew that reheating of food is absolutely harmful and around 50% said that reheating is not harmful.
- Only 57% of women confidently shared that milk should be consumed after boiling.
- When asked about the correct method of washing 57.5% said that washing before cutting is correct whereas 42.5% said washing after cutting is the correct method. Similarly, only 45.2% of women indicated that washing should be done by deepening in deep utensil while majority 54.8% indicated shallow washing is enough.

(18)

Table 6 Distribution of participants according to food handling and safety practices

		Always	Most times	Sometimes	Notoften	Never
FSP_01	I Wash my hand before and					
	during food preparation	44.67	34.67	12.83	7.83	0.00
FSP_02	l clean surfaces, equipments					
	used for food preparation					
	before using on other foods	40.67	18.83	30.00	10.50	0.00
FSP_03	I use separate utensils and					
	cutting boards when preparing					
	raw and cooked food	35.50	0.00	20.83	43.67	0.00
FSP_04	I separate raw and cooked					
	food during storage	24.00	35.17	29.00	11.83	0.00
FSP_05	I checked that food is cooked					
	thoroughly	45.50	22.83	24.50	1.17	6.00
FSP_06	I reheat cooked food until it is					
	piping hot throughout	15.33	19.83	36.17	22.83	5.83
FSP_07	I store the cooked leftovers in					
	a cool place within two hours	26.67	40.17	10.83	22.33	0.00
FSP_08	I wash fruits and vegetables					
	with clean water before eating					
	them	21.67	42.33	36.00	0.00	0.00

- According to study 17.5% and 27.5%, participants consuming food not freshly prepared will not and not necessarily cause food poisoning respectively.
- The presence of rodents in the kitchen not at all attracts the attention of the community, while the presence of flies does not attract the attention of 38% women.



Figure 8 Food Safety Practices percent of families

- The traditional living of the indigenous community was much oriented towards, food-safety, the process of transfer of knowledge was through practice and culture. During the study we came across some practices which attribute to food safety as given below;
- People used to follow taking-out oil through the cold-press process at the household/community level using local tools to avoid contaminations, wooden used for preparing tools were specified either neem, Khair or held.
- Flour-making was also done daily or on the most weekly basis, to avoid the growth of microorganism.
- Spices will be ground on two-three days interval basis, even within that to keep moisture low and reduce chances of contamination adding salt was not allowed.
- Most of the dishes in cooking, particularly in festivals were either roasted directly on fire or deepfried to control the effect of micro-organism growth.
- Water used to be stored in earthen-pots, which have properties of controlling bacteria at least for 24 hours, as a consequence they used to change the water, particularly drinking water every 24 hours.
- Source of drinking water for most of the participating families was hand pump water (64.5%) and around 35.5% consume shallow open-well water.



Dried-Raw-material

Fresh Oil Household-Oil Press Fresh Spice Grinding Tool

5 Discussions and Conclusion

This study, conducted by VAAGDHARA under its project on "promoting sustainable production and consumption systems for safe and organic food in India" around household and farmers level food handling habits and their linkages with "Food Safety". The present study conducted at five blocks of the district of Banswara, Rajasthan, located at the tribal junction of Gujarat, Madhya-Pradesh, and Rajasthan with the participation of 600 women members of the indigenous community. The findings of the study can be concluded as following points giving direction for future action by all those concerned about the food-safety as a measure to promote sustainable consumption and production and fight malnutrition among the indigenous communities.

- In the general indigenous community, people are well aware of the overall concept of foodsafety and food contaminations. There are a number of well-known and widely followed norms pertaining to food-safety hazards, which checks on contamination of food particularly those following the food-handling practices. There are some age-old practices that are commonly followed and considered as effective measures towards food safety, but the majority of the samples do not know about the logical linkages about the modern-day principles and their practices. It seems that food safety knowledge and practices of indigenous communities are in transition and the community widely lacks both knowledge and food handling practices related to foodsafety.
- As per the world bank reports on average 1 in 10 people, every year gets ill by eating unsafe food, and food safety is a shared responsibility, but even food-handlers at home and consumers play a huge role in preventing foodborne diseases. At United Nations level food-safety is a major issue, India also has a full-fledged institutional mechanism around food-safety, i.e. FSSAI, which mostly deals with the norms pertaining to companies, vendors, and suppliers who are involved in the business of food-related products.
- House-hold level food-handling, which is mainly depended on knowledge of individuals, particularly mothers who are involved in the management of feeding of family members. Their knowledge, practices and guidance are critical as in India most of the food-related practices move around them, but community-level awareness buildings and norms are not followed widely. The data thus generated with 600 samples is indicative of wider-scale ignorance on account of modern-day knowledge and practices associated with food-safety.
- It is found that though traditional practices had good linkages with nutrition, foodsafety, and overall health strategies, but with time and contamination of culture itself, practices have contaminated themselves, leaving behind good practices and resulting into higher risks on account of food-safety both in terms of production for self as well as production for market. Therefore, VAAGDHARA has to incorporate food safety as one of its intervention areas with the tribal community so as to reduce their vulnerability against the food-contaminations.
- The adaptation of Food-Safety as one of the important area of intervention by VAAGDHARA will demand for convergence of the modern-day knowledge and practice and indigenous practices from the angle of food-safety following the five keys to safer food, which are a) Keep clean, b) Separate raw and cooked, c) Cook thoroughly, d) Keep food at safe temperatures, and e) Use safe-water and raw materials. In this direction, VAAGDHARA can follow steps shown in Figure-9.
- VAAGDHARA has initiated producer company and working with farmers producer organization towards production, value-addition as one of the major interventions for sustainable income generation source for indigenous community focusing on the organic and safe-food campaign. In this reference, it has to incorporate food-safety as part of its "Sachchi-Kheti and Santulit-Poshan as "Sachchi aur Suddh kheti- se santulit aur swasthy khadhyan" ("Tr5ue-Farming and Balanced Nutrition" to "True and pure Farming and balanced and healthy Food") As Food safety starts from the farm to the plate and contamination can occur anywhere in the food value-chain. Food sanitation, which is a very important and critical aspect, starts from personal hygiene, germ-free preparation area to the dishes being microbes free.

(21)

- Another area where focus should be important is that of growing safer food; grains, pulses, vegetables, fruits, and animal produces. It would also be important to evolve safe-food production practices for items that are included in the business plan of VTFGIPCL. While doing so aspects shown in the figure-9 can give a concrete foundation to build knowledge and systems to evolve "Safe-Food Production Practices"
- Continuous Food safety education in rural areas and motivation is needed to increase the awareness about the WHO's five key principles of food hygiene, which are kept clean, separate raw and cooked food, cook thoroughly, keep food at safe temperatures and use safe water. As these are "Five keys to safer food", which were developed to educate safe food handling behaviors to all consumers and food handlers.
- In order to make tribal area food contamination-free, it has to create wide-scale awareness on foodborne illness and intoxication. Adequate knowledge and practices would be important based on the old saying that "Knowledge is of no value unless you put it into practice". Figure-10 gives major steps that need to be followed to take the learning of this study forward and protect the community against food-borne diseases.



Figure 9 Five Steps for "Growing Safer Food and Vegetables



Figure 10 The Way Forward for VAAGDHARA for "Food-Safe Indigenous Community

6 References

- Assuring food safety and quality guidelines for strengthening national food control systems Joint FAO/WHO Publication.
- Griffith, C. 2000. HACCP and the management of healthcare-associated infections. Int J Health Care Qual Assur 19(4):351-360.
- **3.** ISO standard 22000:2005. Food safety management system Requirements for organizations throughout the food chain, revision 1.**www.iso.org.**
- **4.** Curkovic, S. and R. Sroufe. 2008. An examination of ISO 9000 and supply chain quality assurance. J Operations Management 26(4):503-520.
- 5. www.food.gov.uk.
- Grace D. Food safety in developing countries: an overview. Evidence on Demand; 2017.
 Available from: https://www.gov.uk/dfid-research-outputs/food-safety-in-developing-countries-an-overview.
- **7.** Food: a fundamental human right. Available from:

http://www.fao.org/focus/e/rightfood/right2.htm.

8. WHO. Food hygiene. WHO. Available at:

http://www.who.int/foodsafety/areas_work/food-hygiene/en/.

- Nithya R, Joice S. Study on the Awareness and Practice Regarding Safe Food Handling Practice among Women above the age of 18 years of Rural-Urban & Tribal Areas in Kannur District. Kerala Med J. 2017;10(1):11-7.
- 10. The Five Keys to Safer Food Programme. World Health Organization. 2018. Available at: http://www.who.int/foodsafety/areas_work/food-hygiene/5keys/en/. Accessed on 26th Dec. 2019



सुरक्षित भोजन के पाँच मंत्र



- खाद्य पदार्थों के सम्पर्क में आने से पहले तथा भोजन पकाते समय हाथों को
- भोजन पकाने के प्रयोग में आने वाले बर्तन तथा स्थान को ठीक प्रकार से साफ करें। रसोई घर तथा भोजन को कीड़े-मकोड़ों, जन्तु एवं जानवरों से सुरक्षित रखें।

व्येकी अधिकतर मुध्यजीव वीमारियां नहीं फैलाते, खतरनाक सुध्मजीव खापक रूप मे थिहे, यानी, जानवर एवं धनुष्ठ्यों में पाए जाने हैं। यह मुख्यजीव हावाँ, मुखे कपहाँ एवं वर्तनां, मुख्यतः काटनं कं प्रवाग में लाए जानं वाले वतंत्रों में पाये जाते हैं।इनके संपर्क से मुक्ष्मजीव भोजन में फील जाते हैं तथा दुशित भोजन से उत्पन योमारियों का कारण खनते हैं।

कच्चे एवं, पके हुए भोजन को अलग रखें क्यों

करवा भोजन मुख्यतः मीट, चिकन, समुद्री भोजनऔर उनके रम में खतरनाक सूक्ष्मजीव हो मकते हैं जो दूसरे खाद्य आहारों में भोजन पकाले समय एवं संग्रहित करते समय पील सकते हैं।

• कच्चा मीट, चिकन तथा समुद्री खाद्य पदार्थों को अन्य खाद्य पदार्थों से अलग रखें।-कच्चे खाद्य पदार्थों के लिए अलग उपकरणों तथा बर्तनों का प्रयोग करें जैसे कि

खाद्य पदार्थों को बन्द डिव्वों में रखें जिससे कच्चा एवं पका हुआ भोजन सम्पर्क में

न आ सके।

खाद्य पदार्थों को सुरक्षित तापमान में रखें

पक हुए भोजन तथा जल्दी खराब होने वाले खाद्य पदार्थों को रेफ्रिजरेटर में रखें

• परोसने से पूर्व पके हुए भोजन को अत्यधिक गरम रखें (60 सेन्टीग्रेट से अधिक

सुरक्षित जल तथा कच्चे पदार्थों का प्रयोग करें

पक हुए भोजन को सामान्य तापमान में दो घण्टों से अधिक न छोड़ें।

खाद्य पदार्थों को बहुत अधिक समय के लिए फ्रिज में न रखें। जमे हुए खाद्य पदार्थ को सामान्य तापमान में न पिघलाएँ।

• सुरक्षित जल का प्रयोग करें अन्यथा जल को सुरक्षित करने का उपाय करें।

खाद्य पदार्थ का प्रयोग उसकी समापित तिथि के पश्चात् न करें।

ताज़े और पौष्टिक खाद्य पदार्थों का चयन करें।

- भोजन अच्छी तरह से पकाएँ भोजन को ठीक प्रकार से पकाएँ, मुख्यत: मीट, चिकन तथा समुद्री खाने को। • भोजन जैसे सूप तथा उवली हुई सब्जियों के रस (स्टयू) को ध्यानपूर्वक 70 सेन्टीग्रेट तक उबालें। घ्यान रखें कि मीट तथा चिकन का रस साफ हो, गुलाबी नहीं। उसूलन

- थर्मामीटर का प्रयोग करें। । पके हुए भोजन को ठीक प्रकार से पुनः गरम करें।

٠

दया

ठीक प्रकार में भांजन को चकाने में आंधकता सभी खतरनाक सुख्यजीव नश्ट हो जाते हैं। अध्ययनों के अनुसार भोजन को 70 संदेशोट तापमान तक प्रकान से, यह स्तिप्रियत हो जाता है कि भोजन खाने के लिए सुरक्तित है। खाद्य प्रदार्थ वैसे कोमा, भूना हुआ गीट, चिकन एवं भीट क बई ट्कड्रों को प्रकार समय आंधक ध्यान देने को

आवण्यकता होतो है।

क्या

भोजन को सामान्य तापमान में रखने से मुश्मजीवाँ की संख्या बड़ी शोधता से खड्ती है। घोजन को 5 संस्टीचेंट में कम नापमान या 60 संस्टीचेंट में अधिक ताथमान में रखने से मुहमजीकों में वृद्धि बहुत कम गति से होती है या वे बिल्कुल समाप्त हो वाले हैं। कुछ खनरपाक सूक्ष्मबोब 5 संन्हीचेट रापमान से कम में खढ़ना शुरू हो जाते हैं।

क्या

करुखे पदार्थ जिसमें पानी और बर्फ भी झामिल हैं, हानिकारक मुध्मजीव तथा रसायनो द्वारा दृष्टित हो सकते हैं। आसी भोजन एवं फफ्टी लगे भोजन भें जहरीले रसायन पाए जाते हैं।

• फलों और सब्जियों का सेवन अच्छी तरह से थो कर करें, मुख्यतः यदि कच्चे खाए जाएँ। सजहरात साधव माए जातह। जना साल जगाएँ से साथ साधवानी वाले

Sample Copy

ज्ञान - रोकधाम

(24)

60 œ Danger zone! 5œ

70°C





Head Office : Village & Post Kupra,District Banswara, Rajasthan (India) Ph. : +91-9414082643, Fax : +91-9024573411 E-mail : jjoshi@vaagdhara.org State Cordination Office : State Advocacy Office: Plot No. A-38, Bhan Nagar, Queens Road, Vaishali Nagar, Jaipur (Rajasthan) - 302021; Ph: +91-141-2351582 Website : www.vaagdhara.org