

**METHODS AND
MATERIALS**

CHAPTER IV

METHODS AND MATERIALS

The broad objective of the present study was to study the effectiveness of imparting food safety education to food service providers of urban Vadodara and to determine ways of reducing microbial load on fresh coriander leaves. This chapter discusses the methods and materials used in order to elicit necessary data for above mentioned objectives under the following heads.

4.1 Situational analysis of 153 Food Service Providers (FSPs)

4.2 Establishment of food court

4.3 Development of Information Education and Communication (IEC) materials for imparting food safety education

4.4 Survey of respondents prior to Food Safety Education Intervention (FSEI)

4.4 Imparting Food Safety Education to street food vendors, restaurant owners and food handlers

4.5 Imparting follow up training to street food vendors

4.6 Microbial analysis of fresh coriander leaves

4.7 Statistical analysis

The plan indicating five phases of the study is depicted in Figure 4.1.

STUDY PLAN

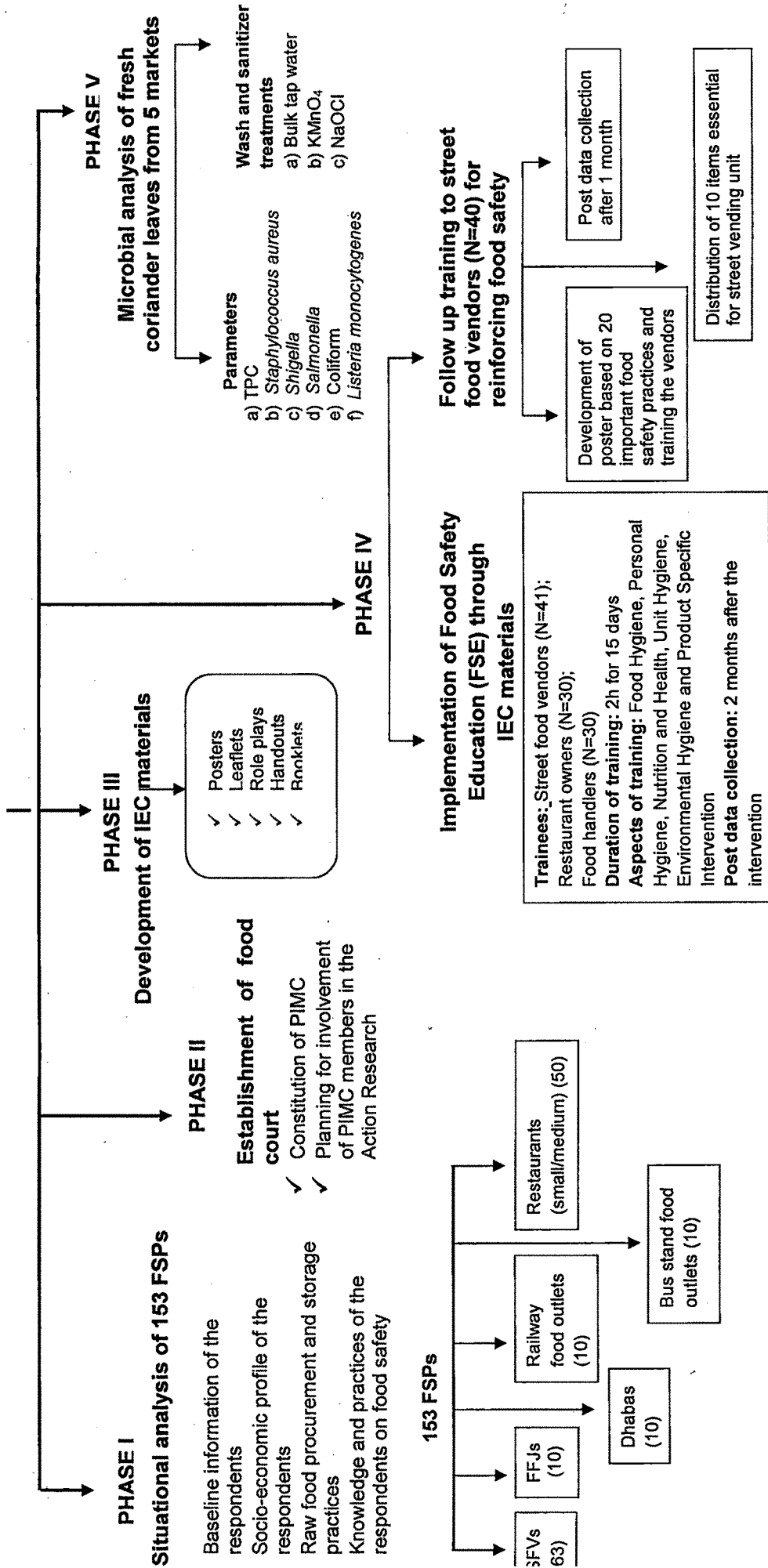


Figure 4.1: Plan indicating the five phases of the study

4.1 SITUATIONAL ANALYSIS OF 153 FOOD SERVICE PROVIDERS (FSPS):

The situational analysis was carried out with the major objective of building database on food service providers and food handlers with special reference to food safety and food quality.

4.1.1 Location of study and sample selection

A map of Vadodara city was obtained from Municipal Corporation of Vadodara (Plate 4.1.1). The city was divided into five zones – North, East, West, South and Central – with due consideration of equal distribution of area (sq. km) in each zone. A list of areas falling in each of the five zones was prepared. Random selection technique was followed in which areas falling in each zone were listed down and were randomly selected using lottery system for survey of different FSPs.

In this phase, about 90 structured and 63 unstructured units were surveyed for their knowledge and practices on food safety. The structured units comprised of small and medium restaurants (N = 50), Fast food joints (N = 10), Bus stand food outlets (N = 10), Railway food outlets (N = 10) and Dhabas (N = 10). The unstructured units comprised of the street food units (N = 63).

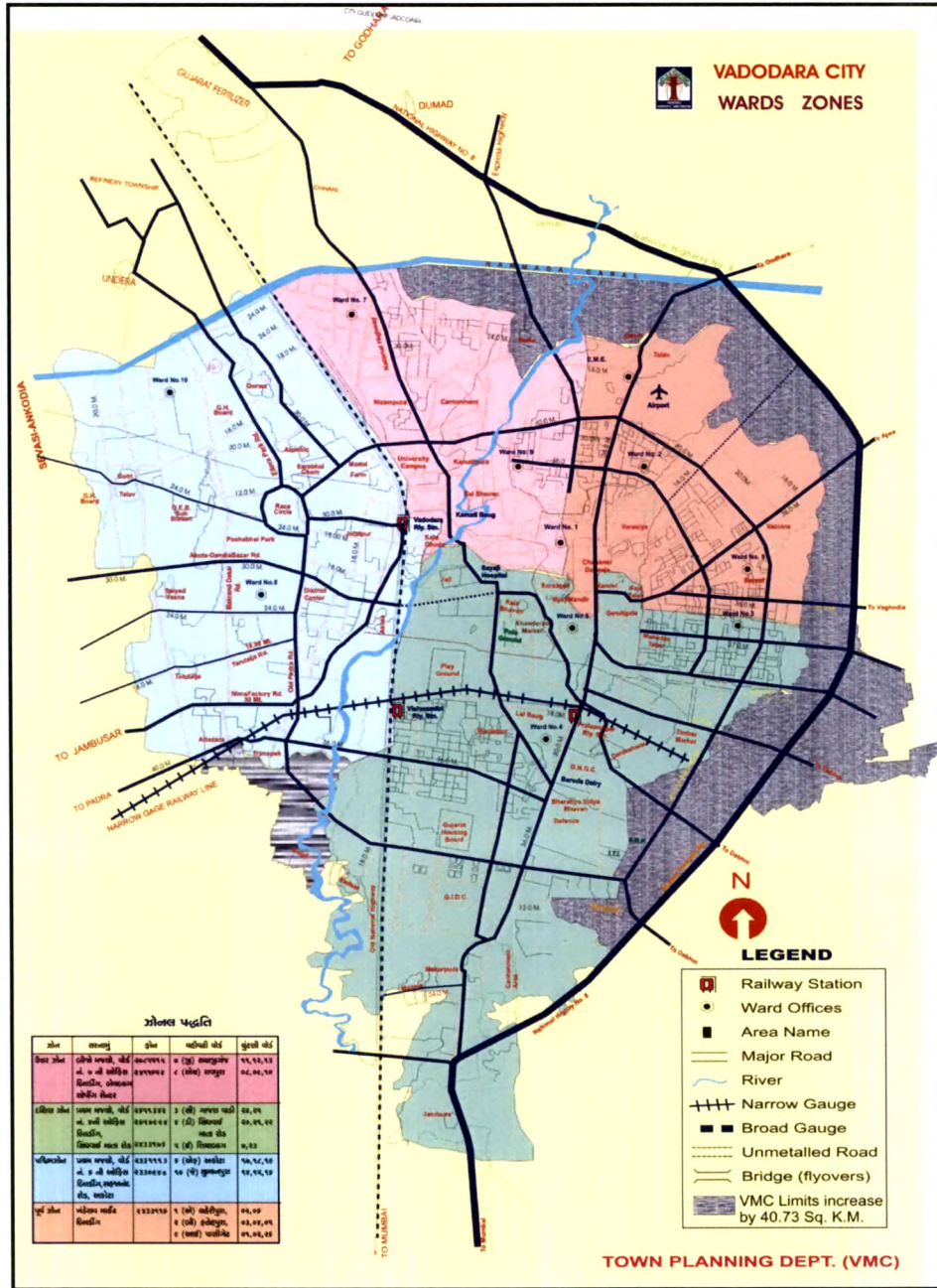


Plate 4.1.1: Map of Vadodara City showing locations of the surveyed FSPs

1. Station
2. Raopura
3. Dandia Bazar
4. Khanderao Market
5. Nyaymandir
6. Ellora Park
7. Polytechnique
8. Fatehgunj
9. Gotri
10. Channi

4.1.2 Tool used for the survey of 153 FSPs

A structured pre coded questionnaire (Appendix No. 10.1) was formulated and used to gather information on the following aspects:

- General information of the respondents belonging to structured and unstructured unit contained information on gender, age and educational status of the respondents as well as nature of jobs done by the family members.
- Unit specific information about the structured and unstructured units included number of employees working in the unit, license of the unit, sitting capacity of the establishment, mode of lighting, source of water supply, availability of water purifier in working condition, working hours of the employees and average number of consumers visiting the establishment on daily basis.
- Raw food procurement and storage practices of the structured and unstructured units.
- Knowledge of the respondents on aspects of food safety such as personal hygiene, food hygiene and nutrition and health.
- Practices of the respondents on personal hygiene, food hygiene, unit hygiene and environmental hygiene.

4.2 ESTABLISHMENT OF FOOD COURT

In order to establish a system of safe supply of ready to eat foods to customers either through street food vendors or restaurants of small and medium type, a systematic approach needs to be employed. This process includes involvement of various governmental and non-governmental bodies, which can put in their expertise to achieve this goal. These stakeholders included Vadodara Municipal Seva Sadan (VMSS) officials, academicians, NGOs, bank officials, head of Street Food Vendors association, small and medium hotel owner's association. The first meeting with the members of PIMC was carried on 17th January, 2007. All

the members of the PIMC were informed about the date, venue and time for the meeting.

VMSS officials: The VMSS officials included the Municipal Commissioner, Chief Medical officers, food inspectors, sanitary officers, city engineer and traffic police.

Municipal Commissioner who headed the PIMC was expected to play a proactive role in terms of taking initiatives to set up food courts in the city.

Food inspectors were expected to regularly monitor the quality of food served by various food service establishments in terms of violation of food safety codes and mobilize the food handlers from restaurants and street food vendors to undergo the training.

Sanitary Officers were expected to monitor the hygiene and sanitation of food service establishments and take actions for violation of the same.

Chief Medical Officers were expected to regularly monitor the health of the food handler of restaurants and street food vendors.

Role of Academicians: Academicians included the coordinator, co-coordinator and field investigators of the M.S. University who were suppose to mobilize all the stakeholders from VMSS and form the PIMC. They were also expected to develop IEC materials such as posters, role plays, films, organize activities, demonstrations and impart training.

Role of NGOs: They were expected to help in formation of self-help groups, mobilizing the various agencies in developing the safe disposable serving wares.

Role of Bank officials: To provide soft loans for improving the infrastructural facilities of various food service establishments.

Role of Heads of Hotel Owner's and Street Vendor's Association:

For formation of self-help groups for achieving the objectives of safe food supply in terms of generating waste disposal facilities, purchasing good

quality materials at subsidized rates and trouble shooting the problems of the food service establishments.

4.3 DEVELOPMENT OF VARIOUS IEC MATERIALS FOR IMPARTING FOOD SAFETY EDUCATION

The following IEC materials were developed for imparting education.

- ◎ **Posters:** A total of 115 posters were designed on the various sessions that were used during the interactive lecturettes. Sample of posters are depicted in plates 4.3.1 - 4.3.60.
- ◎ **Leaflets:** Leaflets on "Why, when and how one should wash hands" (Plate No. 4.3.61) and "Hygienic preparation of Pani puri" (Plate No. 4.3.62) were prepared.
- ◎ **Role plays:** 5 role plays were conceptualized on the five training sessions namely Motivational Training, Food Hygiene, Personal Hygiene, Environmental Hygiene and Product Specific Intervention. These role plays were performed by students in local language. The scripts of the role plays have been appended in Appendix No. 10.2 – 10.6.
- ◎ **Handouts:** Handouts were prepared of all the posters explained to the participants and were distributed at the end of each session of the training program for reinforcing the messages imparted during sessions.
- ◎ **Booklet:** A booklet was developed and handed over to the owners of the restaurants (Plate 4.3.63). It included information on inclusion of the infrastructural facilities, requisites for maintaining personal and environmental hygiene, etc. which are mandatory for any restaurant to attain food safety. It also contained information on job description for the managers, cooks and servers and cleaners and all the necessary food safety tips to be followed during work.

All the IEC materials were prepared in vernacular language (Gujarati and Hindi).

Plate No 4.3.1 to 4.3.9 - Posters on Food Hygiene

જોરાક દ્વારા ઉત્પન્ન થતી બીમારીઓની સંખ્યા



દર વર્ષે, ૭,૦૦,૦૦,૦૦ લોકો બીમાર પડે છે,
૩,૨૫,૦૦૦ દવાખાનામાં દાખલ થાય છે,
તેમજ ૫,૦૦૦ લોકો મૃત્યુ પામે છે.

Plate No 4.3.1

જોરાકથી સંકળાયેલા જોખમ



ભૌતિક પદાર્થો
જાન કાઠક, કાચ પેટું, કોઈક
પીલ, અકાચ કોઈક
ફિલકાની કોઈકાઈક

રાસાયણિક પદાર્થો
ફેબ, ફોલ્પર, પંડુલાયક, ભેનસેન, સાકા કરવા માટે રાસાયણિક પદાર્થો, ફેબીલાઈટર

જૈવિક પદાર્થો
બેક્ટેરીયા, વીરસ, ફૂંડ, વાઈરસ

Plate No 4.3.2

જોરાક દ્વારા ઉત્પન્ન થતી બીમારીના સામાન્ય લક્ષણો



- ▶ ઝાડા-ઊલટી
- ▶ તાવ, અશક્તિ
- ▶ નબળાઈ
- ▶ ચક્રકર આવવા
- ▶ જલ્દી થાક લાગવો

Plate No 4.3.3

ગંભીર લક્ષણો ઉદભવતા સૂક્ષ્મ જીવાણુઓના નામ



સેલમોનેલા, લીસ્ટેરીયા મોનોસાયટોજેનીસ, શીનેલા, ઈ-કોલામ

સામાન્ય રીતે માંસ-માછલી, ઈંડા, મરચી, વગેરે જેવાં જોરાકમાં ઉપર બતાવેલાં સૂક્ષ્મ જીવાણું રહેલા હોય છે. પહા, યોજાઈ ન જાળવીએ તો ઉપર બતાવેલાં જીવાણું હાથ દ્વારા જોરાકમાં આવી શકે છે.

Plate No 4.3.4

જીવાણુઓના ઉત્પત્તિના સ્થાનો



Plate No 4.3.5

તાજાં ફળો અને શાકભાજીની જાળવણી

- લગભગ બધાં જ ફળો બાસવંત છે અને એને સારી રીતે ધોઈ અને યોજવી ફોટી હવા અવરજવર થઈ શકે તેવી ટોપલીમાં ભરવા. શાકભાજી અને ફળો ફેમિયા તાજા જાળવવા અને તાજા જ વાપરવા.
- ફળો જેવાં કે સફરજન, કેળા, સંસા વગેરે પર થોડું તેલ યોગ્યતાથી વધુ સમય માટે તાજા રાખી શકાય. કંદમૂલ જેવાં કે બટાકા શાંદાની હવા અવરજવર થઈ શકે તેવાં કોથળાં કે ટોપલીમાં રાખી કંઠી, સુકી જગ્યામાં બંધાવી શકાય. વધારાના શાકભાજીને તરહે સુકાવી હવા સુકત બનાવતાં સાથવી શકાય. વધારાના ફળો કે શાકભાજીને પંડુલાયક કાચામાં ભરી સાચવી શકાય.

Plate No 4.3.6

સારી ગુણવત્તાવાળા શાકભાજીને ઓળખવાની રીત



- સડેલાં/કાણાંવાળા ન હોવા જોઈએ
- પોચા ન હોવા જોઈએ
- કરમાયેલા / ચીમરાયેલા ન હોવા જોઈએ
- વાસવાળા ન હોવા જોઈએ

Plate No 4.3.7

દૂધની સાચવણી

- દૂધ ઘણું જ જરૂરી બગડી જાય છે. તેને નરમ કરી યોજખા વાસણમાં સુકી જગ્યાએ મૂકી તેને ફરતે ભીનો યોજખો કઠકો વીટાળવો જોઈએ.
- જો ફીઝની સમપડ ન હોય તો દૂધને દિવસમાં બે થી ત્રણ વખત નરમ કરવો.
- દૂધથી બનાવેલી વાનગીઓને લાંબા સમય સુધી ન રાખો (એટલે કે બે કલાક કરતાં વધુ ન રાખો). લાંબા સમય સુધી રાખવા માટે એટલે કે બે કલાક કરતાં વધુ રાખવા માટે ફીઝનો ઉપયોગ કરવો. તેથી દૂધનું ટર્બી, માયો કે ભાનો બનાવી દેવાથી એટ થી બે દિવસ સુધી ફીઝમાં સાચવી શકાય.

Plate No 4.3.8

જોરાક દ્વારા ઉત્પન્ન થતી બીમારીઓનાં ગંભીર લક્ષણો

- હાડકાનો દુખાવો
- દુખાવાથી થતી મૂત્ર
- લકડવાની અસર
- કીડની કામ કરતી બંધ થઈ જવી
- મગજની નસો પર વિપરીત અસર થવી
- મૃત્યુ થવું

Plate No 4.3.9



Plate No 4.3.10 to 4.3.18 - Posters on Food Hygiene

તમામ ખાદ્ય પદાર્થો ખરીદતાં પહેલાં નીચેની બાબતોનું ધ્યાન રાખવું

- દરેક ખાદ્ય પદાર્થ માટે ગુણવત્તાવાળા લેવાનો આશ્રય રાખવો.
- સંમેશ મસાલા અને અનાજ લેબલ વાળા અને માહિતિવાળા લેવો.
- દૂધ કે દૂધથી બનાવેલી વાનગીઓ પેકેટવાળા અને માહિતિવાળા લેવાનો આશ્રય રાખવો જેમકે
- ISO, FPO, એનમાર્ક, વગેરે જેવાં માહિતિવાળી ચીજ વસ્તુ લેવાનો આશ્રય રાખવો.

Plate No 4.3.10

જલ્દી બગડી જાય તેવા ખાદ્યપદાર્થ

Plate No 4.3.11

ફૂડ થર્મોમીટર

Plate No 4.3.12

સંધેલા ખોરાકનો સંગ્રહ

ભેજવાળા સંધેલા ખાવાના પદાર્થોને ૧ કલાકથી વધારે ફ્રીજની બહાર મુકવો નહિ, એમને ઠંડકમાં મુકવા

Plate No 4.3.13

શાકભાજી ઘોવાની પદ્ધતિ

શાકભાજીને સંધેલા ઠંડકમાં અને કાપ્યા પહેલા નળના વહેતા પાણીમાં ધોવા.

જ્યાં નળના વહેતા પાણીની સગવડ ન હોય તો શાકભાજીને નીચે મુજબ ૩ ટબની પદ્ધતિથી ધોવા.

સૌ પથમ ૩ ટબ લેવા

પહેલા ૨ ટબમાં ચોખ્ખુ પાણી લેવું અને ત્રીજા ટબમાં ક્લોરીનનું પાણી લેવું

શાકભાજીને પહેલા ૨ ટબમાં પસોને ધોવા છેલ્લે શાકભાજીને ત્રીજા ટબમાં ક્લોરીનનાં પાણીમાં ધોવા

Plate No 4.3.14

ફ્રીજ અને ફ્રીજરનું તાપમાન જરૂરીયાત મુજબ જાળવવા માટે થર્મોમીટરનું વપરાશ કરવું અને એ તાપમાન નિયમિત રીતે ચકાસવું

Plate No 4.3.15

ખોરાકમાં રહેલા સૂક્ષ્મ જીવાણુની વૃદ્ધિના કારણો

- ખોરાક (વધારે પ્રોટીન, ચરબી, કાર્બોહાઈડ્રેટ્સ)
- તાપમાન (તાપમાન 4-65°C)
- સમય (જમ-જમ સમય જાય તેમ જીવાણુઓની સંખ્યા વધતી જાય)
- ભેજ (Aw > 0.85)
- વધારે ખુટાશ (pH of 4.6 to 7.0) વાળા ખોરાક
- ઓક્સિજન (વાહર અથવા ગેરવાહર)

Plate No 4.3.16

તાપમાનની અસર જીવાણુની વૃદ્ધિ પર

જમ-જમ તાપમાન ઘટવું જાય તેમ-તેમ સૂક્ષ્મ-જીવાણુઓની વૃદ્ધિનો સમય પણ ઘટતો જાય છે

દર અડધા કલાકે	32.22°C	અર્થાત ફિરસોમાં રૂમના તાપમાનમાં
દર ૧ કલાકે	21°C	} શિથાળાનું તાપમાન
દર ૨ કલાકે	15°C	
દર ૩ કલાકે	10°C	} ફ્રીજનું તાપમાન
દર ૬ કલાકે	4.4°C	
દર ૨૦ કલાકે	0°C	} ટીપ ફ્રીજરનું તાપમાન
દર ૬૦ કલાકે	-2.2°C	

Plate No 4.3.17

ખોરાકનો સંગ્રહ

નીચે બતાવેલાં ખાવાના પદાર્થોને ફ્રીજર અથવા ફ્રીજમાં રાખો, જેનાથી એમાં સૂક્ષ્મ જીવાણુઓ વિકાસ ન થાય


ફ્રીજરનું તાપમાન -17.7°C કે ઓછાથી ઓછું રાખો (૧ નાનું ૨ કે વધારી વધારે સમય સંગ્રહ કરી શકાય છે, એમ ફ્રીજરમાં રાખો)


ફ્રીજનું તાપમાન 4.4°C કે ઓછાથી ઓછું રાખો (આ તાપમાન પર ૨-૩ દિવસથી વધારે સમયો ખોરાક ન રાખો)


Plate No 4.3.18


Plate No 4.3.28 to 4.3.31 - Posters on Personal Hygiene

રસોઈ કરનારને અને પીરસનારને નીચેની મુજબ તૈયાર થવું

 દરરોજ દાઢી કરવી

 દરરોજ સવારે રસોઈ કરતા પહેલા સ્નાન કરવું

 રસોઈ બનાવતાં પહેલા સાફ અને ધોયેલા કપડાં પહેરવાં

 રસોઈ બનાવતાં પહેલાં એપ્રન અને હેડગીયર પહેરી લેવા





 જો ખોરાકને ચમચા વગર કે ચીપીયા વગર અડકવું પડે તો ફૂડ ગ્રેડ પ્લાસ્ટીકના હાથ મોજાં પહેરીનેજ અડકવું

Plate No 4.3.28

આહાર બદલની સેવા આપતી સંસ્થાઓના માલીકો અને કાર્યકરો માટે સ્વાસ્થ્યને લગતા જરૂરી સૂચનો

 દર ૬ મહિને સ્વાસ્થ્યની ચકાસણી કરાવવી. ઝીંપો તાવ, કે લાંબા ગાળાની ઉધરસ રહે તો ચોક્કસપણે દવા કરાવવી

 જો ચેપી રોગ જેવા કે ટીબી, કોલેરા, સાલમોનેલોસીસ, શીગેલોસીસ, ચામડીના રોગો, ડીફ્ટેરીયા હોય તો ખોરાક બનાવવો કે પીરસવો નહીં.

 જો ઝાડા, ઊલટી, શર્ટી અથવા તાવ હોય ત્યારે દવા લઈને આરામ કરવો અને ખોરાક બનાવવો કે પીરસવો નહીં





 શરટી ખાસી વખતે નાક અને મોઢા પર ટીસ્ચુ પેપરનો જ ઉપયોગ કરવો. ત્યાર બાદ તેનો તરત કચરાપેટીમાં નિકાલ કરવો.

Plate No 4.3.29

આહાર બદલની સેવા આપતી સંસ્થાઓના માલીકો અને કાર્યકરો માટે સ્વાસ્થ્યને લગતા જરૂરી સૂચનો

 શરીરમાં રહેતા કૂમીઓ નો દર છ મહિને દવા કરીને નીકાલ કરવો.

 શરીરના કોઈપણ ભાગની ચામડી ઉપર ફોડલા કે ગુમડા થયા હોય તો એમને ખુલ્લા ન રાખવા અને તેની દવા કરી તેના ઉપર પટ્ટી બાંધવી.

 ટાઈફોઈડથી બચવા માટે દર ત્રણ વર્ષે ટાઈફોઈડની રસી મુકાવવી.


 કાંચ કે લોખંડ જેવી વસ્તુ વાગવાથી થયેલા ધા માટે ધનુર મુંઠાજે કરાન ચોક્કસપણે લેવું.

Plate No 4.3.30

ખોરાકને ચોખ્ખો અને સુરક્ષિત રાખવા માટેના જરૂરી વ્યક્તિગત ટેવો વિશે સૂચનો

 ખોરાક બનાવતી વખતે શરીર ખંજવાળવું નહીં પણ જો ખંજવાળ આવે તો ખંજવાળીને પછી હાથ ધોવા

 ખોરાકને ચાખવા માટે ચમચી અને વાટકીનો ઊપયોગ કરવો.

 ખોરાક બનાવતી વખતે પાન, બીડી, ગુટપાનું સેવન ન કરવું

 પૈસાને અડક્યા પછી હાથ ધોઈનેજ ખોરાકને અડકવો

Plate No 4.3.31

Plate No 4.3.32 to 4.3.40 - Posters on Nutrition and Health



Plate No 4.3.32

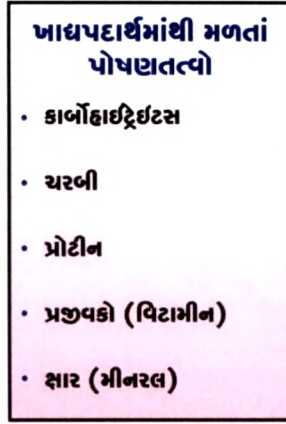


Plate No 4.3.33

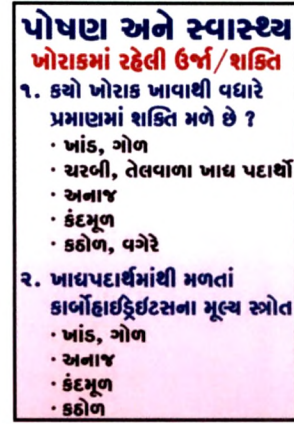


Plate No 4.3.34

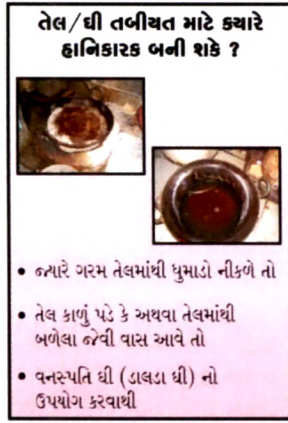


Plate No 4.3.35



Plate No 4.3.36



Plate No 4.3.37



Plate No 4.3.38

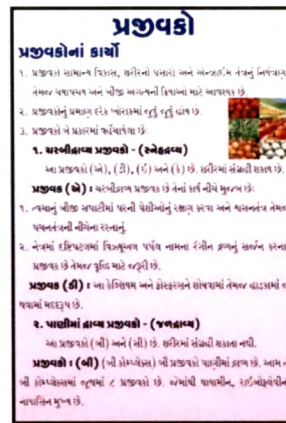


Plate No 4.3.39



Plate No 4.3.40

Plate No 4.3.50 to 4.3.58 - Posters on Environmental Hygiene



Plate No 4.3.50



Plate No 4.3.51



Plate No 4.3.52



Plate No 4.3.53



Plate No 4.3.54



Plate No 4.3.55

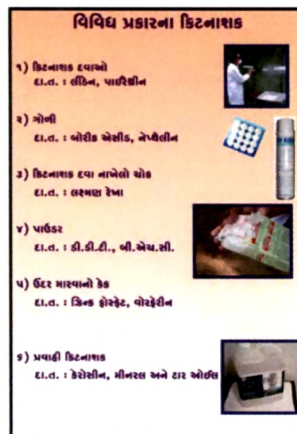


Plate No 4.3.56

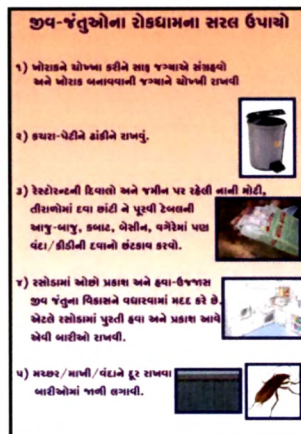


Plate No 4.3.57



Plate No 4.3.58

Plate No 4.3.59 and 4.3.60 - Posters on Product Specific Intervention



Plate No 4.3.59 Poster on preparation of Hygienic Roti



Plate No 4.3.60 Poster on Ideal way of preparation of Hygienic Palak Paneer

યોજના હાથ, સ્વચ્છ ખોરાક

ચાલો આપણે જાણીએ હાથ ધોવાના જરૂરી (મહત્વના) તબક્કા	આપણે ક્યારે-ક્યારે હાથ ધોવા જોઈએ ?	યોજના હાથ તો સ્વચ્છ ખોરાક
સૌ પ્રથમ પાણીથી તમારા હાથ પલાળો.	કચરા-પોતો કાઢ્યા પછી, રસોડું સાફ કર્યા પછી, લૂછવાના કપડાં અડક્યા પછી.	જંદા હાથ
ત્યારબાદ જંતુનાશક લીકવીટ કે સાબુથી ૨૦ સેકન્ડ સુધી ધસો અને આંગળીઓની વચ્ચેના ભાગને ધસો અને બ્રશથી નખને પાણુ ધસો.	હાથથી કચરાપેટીનો ઊંપવો કર્યા પછી. શોવાવચનો ઊંપવો કર્યા પછી. શરીર ખંજવાળ્યા પછી, નાક લૂછ્યા પછી, છાંક આપ્યા પછી. કોઈ પણ પ્રાણીઓને અડક્યા પછી અને પેસાને અડક્યા પછી.	યોજના હાથ
પછી હાથને સાદા પાણીથી ધોઈને યોજના ક્રમાવધી તમારા હાથને લૂછો.	ઉપર મનાવેલાં બધાં કાચો કર્યા પછી હાથ ધોવા જોઈએ. પરંતુ ખોરાક અનાવનાં, પીરસના અને ખાતા પહેલાં તો યોજનાપૂર્વક મનાવેલી રીતથી હાથ ધોવા જ જોઈએ.	યોજના હાથમાં મીઠાની કેવાવનારા, સુકમ-જવાણુઓ રહેતાં નથી ↓ હાથ ધોવાથી હાથ યોજના રહે છે ↓ યોજના હાથથી ખોરાકને અડકવામાં આવે તો ↓ ખોરાકમાં જવાણુની સંખ્યા ઓછી રહે છે અને ખોરાક જરૂરી બનતો નથી ↓ આવો ખોરાક ખાવાથી જાનિને મીઠાની થવાની શક્યતા ઓછી રહે છે.

Plate 4.3.61: Leaflet on “Why, when and how one should wash hands”

“સ્વચ્છ અને સુરક્ષિત પાણીપુરી બનાવવાનો નુસ્ખો”

પાણીપુરીનું પાણી	પાણીપુરીનો માવો	પાણીપુરીની પુરી	પાણીપુરી પીરસવાની રીત
<ul style="list-style-type: none"> જુદીનો, પાચા, લીલાં મરચાં, લીનુ બજારમાંથી સારી ગુણવત્તા વાળા પત્તીદવા અને વપરાશ પહેલાં ૩ થી ૪ વાર નખનાં પાણીથી ધોવા અને તેને સ્વચ્છ મિક્સર (અથવા પાણીથી ધોવેલું)માં પીસી નાખવું. આ પીસેલા મસાલાને સ્વચ્છ નળામાં (જે સ્વચ્છ પાણીથી ધોયો) અને યોજના પીવાનું પાણી (આર.ઓ. પાણી) (કેટલીમાં પ્રક્રિયા કર્યા પછી) સ્વચ્છ પાણી કે પછી મુનિસિપાલિટીનું સ્વચ્છ પાણી વાપરવું. ISI/એનભાર્ગવ ના મારકિલા સાચા મસાલા પત્તીદવા અને તેને સ્વચ્છ વજાળાને સંકલ કરવો. જે અડકનો વપરાશ કરવો હોય તો એ અડકને સ્વચ્છ પાણીમાં ધોઈને જ નાખવો. બધેથી પાણીનો ઉપયોગ બીજા કોઈને ન કરવો. 	<ul style="list-style-type: none"> સારી ગુણવત્તા વાળા સ્વચ્છ અટકા અને વાણા પત્તીદવા. એનભાર્ગવ/ISIના મારકિલા મસાલા પત્તીદવા અને તેનો સ્વચ્છ વજાળાને સંકલ કરવો. ચણા અને અટકાને સ્વચ્છ પાણીમાં બાકાવા, હાથ ધોઈને છાંવવા અને ત્યારબાદ ગુણવત્તાવાળા મસાલા નાખવા. અટકાને ધાણથી ના મસાલા અને મસાલાનું સાંપન વાપરવું. પાણીપુરીના માવને પદમોકોલા ડબ્બામાં ભરે માપી સ્વચ્છ વજાળાને સંકલ કરવા. આ ચણા અટકાના માવને વધુ પહેલાં ન અનાવવું પરંતુ વેચાણમાં ૧ થી ૨ કલાક અગાઉ જ તૈયારી કરવી. બધેથી માવો બીજા કોઈને ન વાપરવો પણ તેનો નીકાલ કરી દેવો. 	<ul style="list-style-type: none"> મોંઠા/પડનો લોટ/રવો/અડકની દાખ સારી ગુણવત્તાવાળી ધોવી જોઈએ. સારી ગુણવત્તા વાળું તેલ વાપરવું. તળેલા તેલને વારંવાર પુરી તળવામાં ઉપયોગમાં ન લેવું. ખોરી પુરીનું વેચાણ ન કરવું. પુરીનો સંકલ બેજર વાળી વજાળાને ન કરવો અને મોટા ડબ્બામાં બેજ રાખવી. વેચની વખતે પણ પુરીને ખુલામાં ન રાખવી. 	<ul style="list-style-type: none"> સાબુથી હાથ ધોઈ બચવા હાથમોજ પહેરીને જ માવો ભરવો. નાની ચમચીનો પ્રયોગ માત્ર ભરવામાં કરવો. <p>પાણીપુરીમાં પાણી ભરવાની રીત:</p> <ul style="list-style-type: none"> નીકાલબેજ વજાળામાં ભરીને પીરસવું. ચાંચા હાથવાળાં ટેપાનો પ્રયોગ કરવો. નળવાળા નળાંમાંથી પાણી પીરસવું. હાથનો સંકલ માવા કે પાણીથી ન થવો જોઈએ.

Plate 4.3.62: Leaflet on hygienic preparation of ‘pani puri’

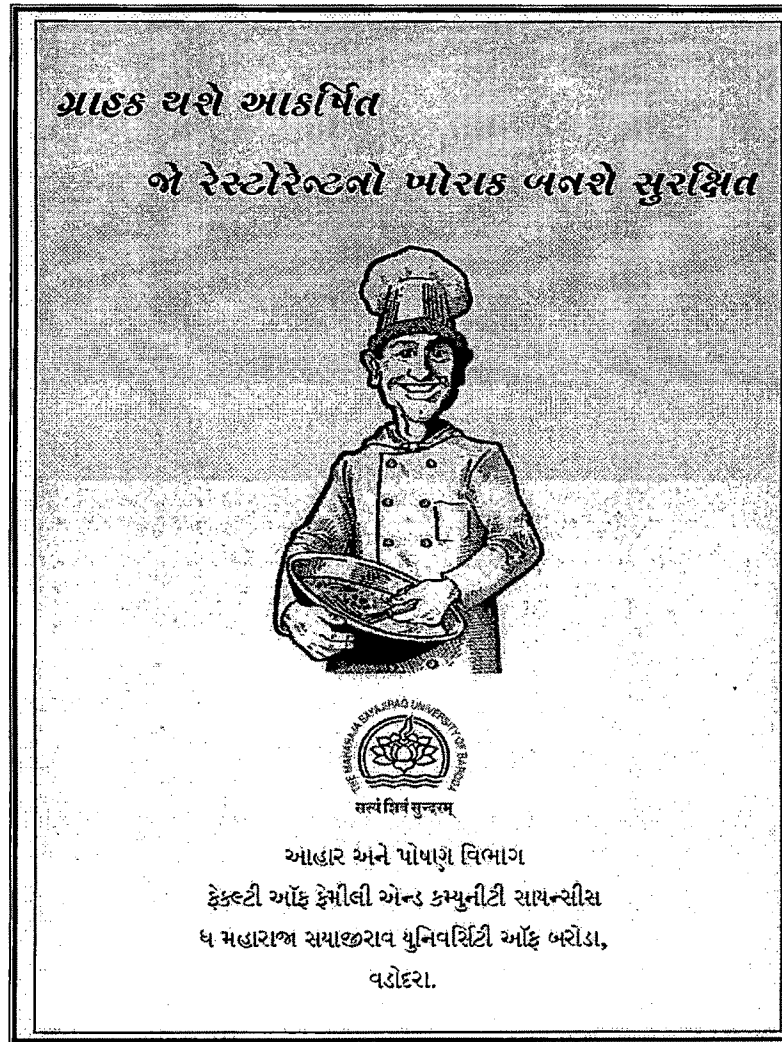


Plate 4.3.63: Front page of the booklet on food safety developed for the restaurant owners

4.4 DETERMINATION OF KNOWLEDGE AND PRACTICES OF RESPONDENTS PRIOR TO FOOD SAFETY EDUCATION INTERVENTION (FSEI)

A prior permission was sought from the owners of the restaurants for collecting the required information about the restaurant as well as on the food handlers, with the assistance of food inspectors of Vadodara Municipal Seva Sadan (VMSS). Three different structured, pre coded questionnaires was used to assess the Knowledge and Practices of the street food vendors (Appendix 10.7), restaurant owners (Appendix 10.8) and food handlers (Appendix 10.9).

4.5 IMPARTING FOOD SAFETY EDUCATION

Food safety education was imparted to street food vendors (N = 41) from two location, restaurants owners (N = 30) and food handlers (N =30). The beneficiaries were educated on the 6 basic aspects of food safety for a period of 15 days for 2h each. All the food safety training sessions were conducted in the auditorium of Faculty of Family and Community Sciences, the M.S. University of Baroda, and the afternoon time was selected for the training since it was convenient to most of the street food vendors. The details of the content covered and methods used for imparting food safety messages on various aspects for street food vendors and restaurants owners and food handlers are presented in table 4.5.1 and 4.5.2 respectively.

Table 4.5.1: Details of the contents covered for the training sessions for street food vendors

Training Intervention (1-15)	Lesson (Against each intervention)	Training Materials Developed (Against each lesson)	Contents Covered (Against each lesson)
Orientation Program (S1)	Motivation and orientation	Motivational film (Appendix No. 10.2)	<ul style="list-style-type: none"> ➤ SFVs have important role and vital contribution in providing food to the students, tourists, daily commuters, etc. ➤ They deserve appreciation for this contribution
Food Hygiene (S2)	Food borne diseases and their prevention	Lecturettes, Posters	<ul style="list-style-type: none"> ➤ Basic information about FBI ➤ Carriers of FBI – chemical, physical deformities, germs, bacteria, parasites, insects and pests ➤ Symptoms of some common FBDs ➤ How to prevent FBDs through food safety measures
Food Hygiene (S3)	Procurement and storage of food	Lecturettes, Posters	<ul style="list-style-type: none"> ➤ Procurement of safe and fresh perishables ➤ Procurement of packaged and labeled ingredients ➤ Use of safe storage containers for cooked food, raw food and take home foods
Food Hygiene (S4)	Safe food handling practices	Lecturettes, Posters, Video films	<ul style="list-style-type: none"> ➤ Pre processing practices – cleaning, washing, peeling, chopping of fruits and vegetables ➤ Sources of cross contamination and avoidance through safe food handling practices

Methods and Materials

			<ul style="list-style-type: none"> ➤ Time and temperature management for cooking, safe storage, holding of raw and cooked food
Food Hygiene (S5)	Use of leftover food and safe ice water for washing and drinking	Posters	<ul style="list-style-type: none"> ➤ Management of leftover food ➤ Sources and safe use of water for washing and drinking ➤ Safe storage and use of ice
Nutrition and Health (S6)	Conservation of nutrients	Posters	<ul style="list-style-type: none"> ➤ Role of food for growth, maintenance and protection of human body ➤ Basic food pyramid and nutrients ➤ Nutrient losses during cutting, washing, soaking, grinding, cooking, deep frying ➤ Prevention of losses through proper processing and cooking
Nutrition and Health (S7)	Beware of food adulterants and intoxications	Posters	<ul style="list-style-type: none"> ➤ Food specific adulterants ➤ Adverse effects of adulterants and intoxication ➤ Redressal of food adulteration problems ➤ Safe use of leftover oil
Nutrition and Health (S8)	Value addition and food quality aspects	Posters	<ul style="list-style-type: none"> ➤ Significance of value addition in street foods ➤ Ways and means of value addition in street foods ➤ Product specific tips of value addition
Personal Hygiene (S9)	Personal grooming and adoption of good habits	Posters, Role play	<ul style="list-style-type: none"> ➤ Personal grooming including regular hair cutting and use of hair restraints, regular shaving, nail cutting, bathing, clean clothing, use of apron, gloves, frequent hand washing, use of napkins ➤ Control on bad habits like eating pan, gutkha, tobacco chewing, spitting, smoking, nose wiping, sweat wiping, scratching body parts, tasting of prepared food, etc.
Personal Hygiene (S10)	Keeping yourself and your workers clean	Posters	<ul style="list-style-type: none"> ➤ Care of wounds through proper bandage, care during sneezing and coughing, diarrhea, vomiting, importance of regular health check ups. ➤ Awareness about food contamination through bad habits and common health problems and their consequences on the health of consumers.
Unit Hygiene (S11)	Basic requirements of a Mobile Street	Posters	<ul style="list-style-type: none"> ➤ Storage of raw materials and cooked food ➤ Utensils / disposables

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	Food Unit in terms of storage and cleaning of food cart		<ul style="list-style-type: none"> ➤ Water for washing and cooking ➤ Methods of cleaning of different work surfaces ➤ Material required for cleaning of food cart ➤ Use of disinfectants ➤ Cleaning of cooking appliances
Unit Hygiene (S12)	Improved Design of food cart	Power point presentation	<ul style="list-style-type: none"> ➤ Improved material for work surface ➤ Functionally feasible storage ➤ Pull out sink for hand washing ➤ Overhead water tank ➤ Cold storage facility ➤ Facility to collect the cooking waste below the work surface
Environmental Hygiene (S13)	Environmental Hygiene	Posters, Role play	<ul style="list-style-type: none"> ➤ General cleaning of the immediate surroundings ➤ Disposal of waste water for cleaning of immediate surroundings ➤ Disposal of disposables – plates, bowls, pouch, bottles, glasses, cups, bags, etc. ➤ Location of unit preferably at clean locations ➤ Need and importance of street food vendors zone for food safety jam free traffic in the cities ➤ Role of vendors association in addressing the vendors problems
Product Specific Intervention (S14)	Ideal way of preparation and serving of hygienic <i>pani puri and bhel puri</i>	Posters, Role play	<ul style="list-style-type: none"> ➤ Preparation practices for preparation of <i>pani puri and bhel puri</i> ➤ Care to be taken while preparation of <i>pani puri and bhel puri</i> ➤ Ideal way of waste disposal ➤ Preparation of chlorine water ➤ Preparation of chutneys ➤ Serving of <i>pani puri and bhel puri</i>
Product Specific Intervention (S15)	Ideal way of preparation and serving of hygienic juice	Posters, Role play	<ul style="list-style-type: none"> ➤ Preparation practices for preparation of <i>juice</i> ➤ Care to be taken while preparation of juice ➤ Ideal way of waste disposal ➤ Preparation of chlorine water ➤ Ways to keep food cart clean ➤ Serving of juice

Table 4.5.2: Details of the contents covered for the training sessions for Restaurant owners and handlers

Training Intervention (1-15)	Lesson (Against each intervention)	Training Materials Developed (Against each lesson)	Contents Covered (Against each lesson)
Orientation Program (S1)	Motivation and orientation	Motivational film	<ul style="list-style-type: none"> ➤ Food service providers have important role and vital contribution in providing food to the students, tourists, daily commuters, etc. ➤ They deserve appreciation for this contribution
Food Hygiene (S2)	Food borne diseases and their prevention	Lecturettes, Posters, Video films	<ul style="list-style-type: none"> ➤ Basic information about FBI ➤ Carriers of FBI – chemical, physical deformities, germs, bacteria, parasites, insects and pests ➤ Symptoms of some common FBDs ➤ How to prevent FBDs through food safety measures
Food Hygiene (S3)	Procurement and storage of food	Lecturettes, Posters	<ul style="list-style-type: none"> ➤ Procurement of safe and fresh perishables ➤ Procurement of packaged and labeled ingredients ➤ Use of safe storage containers for cooked food, raw food and take home foods
Food Hygiene (S4)	Safe food handling practices	Lecturettes, Posters	<ul style="list-style-type: none"> ➤ Pre processing practices – cleaning, washing, peeling, chopping of fruits and vegetables ➤ Sources of cross contamination and avoidance through safe food handling practices ➤ Time and temperature management for cooking, safe storage, holding of raw and cooked food
Food Hygiene (S5)	Use of leftover food and safe ice water for washing and drinking	Posters	<ul style="list-style-type: none"> ➤ Management of leftover food ➤ Sources and safe use of water for washing and drinking ➤ Safe storage and use of ice
Nutrition and Health (S6)	Conservation of nutrients	Posters	<ul style="list-style-type: none"> ➤ Role of food for growth, maintenance and protection of human body ➤ Basic food pyramid and nutrients ➤ Nutrient losses during cutting, washing, soaking, grinding, cooking, deep frying

			<ul style="list-style-type: none"> ➤ Prevention of losses through proper processing and cooking
Nutrition and Health (S7)	Beware of food adulterants and intoxications	Posters	<ul style="list-style-type: none"> ➤ Food specific adulterants ➤ Adverse effects of adulterants and intoxication ➤ Redressal of food adulteration problems ➤ Safe use of leftover oil
Nutrition and Health (S8)	Value addition and food quality aspects	Posters	<ul style="list-style-type: none"> ➤ Significance of value addition in street foods ➤ Ways and means of value addition in street foods ➤ Product specific tips of value addition
Personal Hygiene (S9)	Personal grooming and adoption of good habits	Posters	<ul style="list-style-type: none"> ➤ Personal grooming including regular hair cutting and use of hair restraints, regular shaving, nail cutting, bathing, clean clothing, use of apron, gloves, frequent hand washing, use of napkins ➤ Control on bad habits like eating pan, gutkha, tobacco chewing, spitting, smoking, nose wiping, sweat wiping, scratching body parts, tasting of prepared food, etc.
Personal Hygiene (S10)	Keeping yourself and your workers clean	Posters	<ul style="list-style-type: none"> ➤ Care of wounds through proper bandage, care during sneezing and coughing, diarrhea, vomiting, importance of regular health check ups. ➤ Awareness about food contamination through bad habits and common health problems and their consequences on the health of consumers.
Unit Hygiene (S11)	Basic unit hygiene requirements of food service establishments	Posters	<ul style="list-style-type: none"> ➤ Improved material for work surface ➤ Functionally feasible storage ➤ Cold storage facility
Unit Hygiene (S12)	Maintenance of work unit and appliances such as refrigerator, stove etc	Posters	<ul style="list-style-type: none"> ➤ Maintenance and cleanliness of refrigerator, stove, etc.
Environmental Hygiene (S13)	Significance of maintaining environmental hygiene	Posters	<ul style="list-style-type: none"> ➤ General cleaning of the immediate surroundings ➤ Disposal of waste water for cleaning of immediate surroundings ➤ Disposal of disposables –

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			plates, bowls, pouch, bottles, glasses, cups, bags, etc. ➤ Location of unit preferably at clean locations
Product Specific Intervention (S14)	Safe way of preparation and serving of <i>roti</i> and <i>palak paneer</i>	Posters	➤ Ideal way of preparing and serving of <i>roti</i> and <i>palak paneer</i>
Infrastructural requisites for restaurants (S15)	Suggestions on various requisites pertaining to infrastructure, personal hygiene and environmental hygiene	Posters	➤ Facilities required for maintaining personal hygiene of the staff such as antiseptic soap, clean napkin, head gear, apron etc, and environmental hygiene of the restaurant such as separate dustbins for dry and wet waste, regular cleaning of dustbins, use of insecticides, etc

The restaurant owners and food handlers, were also educated on tasks to be performed by the manager, food safety tips for cooks, food safety tips for waiters and cleaners and infrastructural facilities required in a restaurant

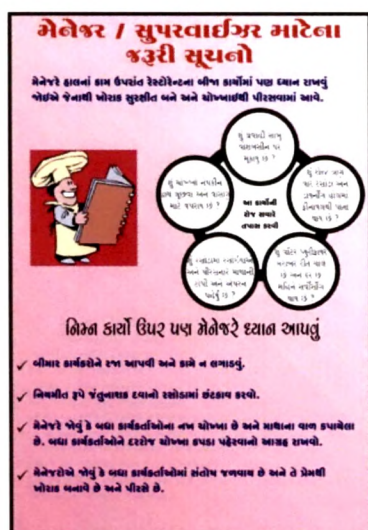


Plate No 4.5.1 - Food safety tips for manager/supervisor of food service establishment



Plate No 4.5.2 - Food safety tips for cooks



Plate No 4.5.3 - Food safety tips for cleaners



Plate No 4.5.4 - Important tips to be kept in mind by cooks during food preparation



Plate No 4.5.5 - Food safety tips for servers

In addition to the above mentioned training materials, a personal hygiene kit (Plate 4.5.6) containing various essentials such as disposable apron, head gear, band-aid, antiseptic cream, etc was also distributed at the end of the personal hygiene session. The beneficiaries were given various activities to perform so as to reinforce the food safety concepts related to the training sessions.



Plate 4.5.6: Distribution of personal hygiene kits

The beneficiaries were given various activities to perform so as to reinforce the food safety concepts related to the training sessions.

Activities on Food Hygiene:

Microscopic examination of dirt on plate (plate 4.5.7)

Objectives:

- To make them understand that the plates that appear clean may not necessarily be so.
- To teach them the importance of proper dish washing

Materials required: 2 plates, sanitizer (Chlorine water), dirty cloth and magnifying glass

Duration: 15 minutes

Steps:

- a) Division of food handlers into group of five.
- b) Take a clean plate that has been rinsed with sanitizer (chlorine water) and other plate that has been wiped with a dirty cloth.
- c) The 2 plates will be seen with the magnifying glass by the food handlers.

- d) When seen without the magnifying glass, both the plates appear to be clean. The difference is clear when seen with the magnifying glass.
- e) The plate that has been wiped with a dirty cloth will show the presence of dirt specs, while the other will appear to be sparkling clean.

Three tub washing method of vegetables

Objectives:

- To teach them the importance of washing vegetables under running water
- To tell them the importance of washing vegetables with sanitizer
- To teach them the preparation of chlorine water

Materials required: Green leafy vegetables such as palak, coriander leaves, root vegetables such as potato and carrot, other vegetables such as cabbage, colander and tap water

Duration: 25 minutes

Steps:

- 1) Divide them into group of five and distribute the five vegetables to each group.
- 2) Take the vegetables in the colander, and wash them under running tap water by scrubbing so as to remove dirt.
- 3) Repeat this same activity at least for 3 to 4 times.
- 4) Finally give a wash with the chlorine water.

Activities on Personal Hygiene:

5 steps of hand washing (plate 4.5.8)

Objectives:

- To teach them the 5 steps of hand washing
- To tell about the importance of hand washing before and after handling food

Material required: 5 sinks, liquid soap, napkins and nail brush

Duration: 20 minutes

Steps:

- 1) Division of food handlers into group of five.
- 2) Ask them to wet hands with water.
- 3) Take liquid soap and work up a good lather rubbing your hands for 20 seconds.
- 4) Make use of a nailbrush for scrubbing gently the areas in between fingers and nails.
- 5) Rinse hands with water and turn off the faucet with a clean towel.
- 6) Wipe dry hands with a clean towel / electrical drier.

Nail cutting activity (plate 4.5.9)

Objectives:

- To teach the food handlers that it is a must to keep their nails short and clean
- To teach them the use of nail cutter for cutting nails.

Material required: Five nail cutters

Duration: 20 minutes

Steps:

- 1) Division of food handlers into group of five.
- 2) Each of the food handlers will cut their nails using nail cutter.
- 3) Group discussion on the views of food handlers regarding nail cutting as a regular habit and its importance.

Activities on Nutrition and Health:

Activity on identification of various foods rich in nutrients (plate 4.5.10)

Objectives:

- To teach them about the various foods rich in nutrients

Materials required: Food items (apple, milk, oil, butter, milk, spinach, rice, wheat, paneer, jaggery. Papaya, lemon, orange and bread), table, tablecloth, utensils

Duration: 15 minutes

Steps:

- 1) Division of food handlers into group of five.

- 2) Mix the foods and keep them in 5 different plates.
- 3) The participants will then be asked to sort the foods rich in energy, protein, vitamin A, vitamin C, iron and calcium.

Activity on labeling the unlabeled food pyramids

Objectives:

- To teach them about the role of Food pyramid in maintaining good health.
- To sensitize them about the amounts to be consumed under various food groups.

Material required: sketch of blank food pyramids without the labels

Duration: 15 min

Steps:

- 1) Distribute leaflets with picture of unlabeled food pyramid and ask them to label.
- 2) The participants would be then be asked to grade the food products based on the amounts in which it should be consumed.

Sensory evaluation of foods with varying levels of oil and salt

Objective:

- To make them understand that tasty food can be prepared by use of less oil and salt.

Materials required: cooked dal that has minimum to extreme level of salt, cooked paneer veg that has minimum to extreme level of paneer, bowls, spoons

Duration: 30 min

Steps:

- 1) Prepare 4 samples of dal (100 ml each), and add $\frac{1}{4}$ tsp, $\frac{1}{2}$ tsp, $\frac{3}{4}$ tsp, 1 tsp of salt respectively to each bowl.
- 2) For paneer sabji, make 4 samples and add $\frac{1}{4}$ tsp, $\frac{1}{2}$ tsp, $\frac{3}{4}$ tsp, 1 tsp of oil respectively to each bowl.
- 3) Prepare two tables, one with cooked dal and other with cooked paneer sabji.
- 4) Have separate spoons for each bowl.

- 5) The participants should be instructed as to drink water after tasting of each sample.
- 6) The participants will be provided with an evaluation sheet to record their comments.

Detection of adulterants in turmeric, milk, tea leaves, sugar and chilli powder (plate 4.5.11)

Objectives:

- To impart knowledge on common food adulterants
- To teach them ways to identify adulterants in foods

Materials Required: Turmeric, red chilli powder, milk, sugar, tea leaves, hydrochloric acid, iodine, filter paper, test tubes, water, glass, dark polished surface,

Duration: 35 mins

Steps:

a) Adulteration test for turmeric:

Take a tsp full of turmeric powder in a test tube. Add a few drops of concentrated hydrochloric acid. Instant appearance of violet color, which disappears on dilution with water. If the color persists presence of metanil yellow (artificial dye) which is a non permitted coal tar dye is indicated.

b) Adulteration test for Chilli powder:

Water soluble artificial dye can be detected by sprinkling a small quantity of chilli powder on the surface of water contained in a glass tumbler. The soluble dye will immediately start descending in color streaks.

c) Adulteration test for milk:

The presence of water in milk can be detected by putting a drop of milk on a polished vertical surface. The drop of pure milk either stops or flows slowly leaving a white trail behind it; whereas milk adulterated with water will flow immediately without leaving a mark.

d) Adulteration test for sugar:

Dissolve sugar in a glass of water, chalk will settle down at bottom.

e) Adulteration test for tea leaves:

Tealeaves when sprinkled on wet filter paper, would immediately release added color.

Activities on Unit and Environmental Hygiene:

Activity on table cleaning

Materials required: 3 soiled tables, 3 tubs of chlorine water, 3 dust pans, plastic wipers, tissue paper, running tap water facility and 3 clean cotton cloths

Duration: 20 minutes

Objectives:

- a. To explain the importance of table cleaning
- b. To provide clear knowledge and understanding about relation between food hygiene and table cleaning
- c. To guide the trainees towards the table cleaning procedure
- d. To observe trainees performing the given task

Steps:

1. Divide the participants into groups of 3 and ask them to follow the cleaning procedure as under.
2. Remove the food particles from the table into dust pan with the help of wiper.
3. Wipe the table surface with tissue paper in case of gravy, curry or any other liquid if present.
4. Clean the surface with the cotton cloth dipped into the chlorine water.
5. Wash the same cloth under the running tap water.
6. Finally squeeze the cotton cloth into chlorine water and use it for another table cleaning.

Cleaning procedure of cooking range

Materials required: One tumbler of luke warm water, detergent powder, nylon scrubber, dry cloth, old tooth brush, needle

Duration: 20 minutes

Objectives:

- To explain the importance of cooking range cleaning
- To provide clear knowledge and understanding about relation between food hygiene and cooking range cleaning
- To guide the trainees towards the cleaning procedure of cooking range
- To observe trainees performing the given task

Steps:

- 1) Remove food particles from the cooking range and wipe it with the dry cloth.
- 2) Prepare luke warm soapy water solution in one tumbler as explained.
- 3) Separate the burners and clean it with sharp needle and soapy water so that all the pores can be thoroughly cleaned.
- 4) Rinse the cooking range with the soapy water. Scrub the surface properly with the help of nylon scrubber.
- 5) Clean every nook and corner with the old toothbrush.
- 6) Rinse it with warm plain water and wipe with dry cloth finally.
- 7) Let the burners dry and then attach them back to the cooking range.

Cleaning of iron Kadhai

Materials required: Dirty black iron *kadhai*, iron / steel scrubber, cooking range, detergent, running tap water

Duration: 20 min

Objectives:

- To teach them the correct method of cleaning the utensils used for frying.

Steps:

- 1) Place the black *kadhai* to be cleaned on the gas stove for about 10 min on full flame, till the grease layer starts dripping.
- 2) Invert the *kadhai* and repeat the same procedure for about 5 min.
- 3) Wash it using detergent and iron scrubber.
- 4) Rinse with water

Cleaning procedure of garbage bin and its preparation of use

Materials required: Luke warm soapy water solution, used garbage bin, one large or medium sized polythene bag, nylon scrubber, plain water (running tap water)

Duration: 15 min

Objectives:

- a. To make trainees understand the importance of garbage bin as waste disposal practices.
- b. To explain the correct cleaning procedure and preparation of dust bin before its use.
- c. To observe the trainees while performing the activity in correct manner as they were being taught.

Steps:

1. Divide the trainees into group of 3
2. Lead trainees to wash dust bin with the running tap water first
3. Scrub it with the warm soapy water and scrubber
4. Again wash it with the running plain water
5. Lead trainees to wash dust bin with the plain water and keep it under sunlight for drying
6. After the dust bin become dry, place a polythene bag inside before use.

Activity on Product Specific Intervention:

Preparation of chutney for enhancing its shelf quality

Objectives:

- To teach the food handlers the ideal method for preparation of green chutney
- To teach them about the addition of preservative to green chutney

Materials required: Coriander leaves, green chillies, ginger, salt, lemon juice, preservative, chlorine water, water for washing, colander, mixer, stainless steel knife, apron, hand gloves, head gear

Duration: 60 min

Steps:

- a) Wear aprons, head gear and hand gloves and wash hands with liquid soap before starting work.
- b) Wash coriander leaves under running tap water using colander.
- c) Sanitize the grinder with chlorine water. The bottle in which chutney is to be stored is sterilized by keeping in boiling water upside down for 20 min.
- d) Add preservative to green chutney to increase its shelf life if required to be stored for more than 12 h.

Steps involved in preparation of hygiene juice

Objectives:

- To teach them the ideal method of juice preparation of juice
- To teach them the importance of washing the fruits, utensils and machine parts chlorine water

Materials required: Oranges, juice maker, knife, chlorine water, 3 tubs, plain water, head gear, hand gloves, apron, napkins

Duration: 30 min

Steps:

- a) Wear aprons, head gear and hand gloves before juice preparation
- b) Use of 3 tub method for washing fruits, machine parts
- c) Use of 3 different napkins for 3 different activities for personal use, wiping platform and cleaning *laari*.
- d) Sanitizing the platform with chlorine water
- e) After use dip the stainless steel knife in chlorine water
- f) Peel the fruits



Plate 4.5.7: Food handlers examining dirty plates using magnifying lens



Plate 4.5.8: Activity on hand washing



Plate 4.5.9: Activity on cutting nails



Plate 4.5.10: Street food vendors identifying the protein and energy rich foods from the assorted food items displayed after the training session on Nutrition and Health




Plate 4.5.11: Vendors performing tests to determine adulterants in foods

IMPARTING FOLLOW UP TRAINING TO STREET FOOD VENDORS

After a period of 10 months, the Follow-up training program was carried out on the various aspects such as Food hygiene, Personal hygiene, Unit hygiene and Environment hygiene was conducted for 40 street food vendors who were already trained in the previous phases. The impact of training imparted was studied using a structured questionnaire appended in (Appendix No. 10.10) based on 20 important desirable practices that are necessary for serving safe food to the public. The teaching aids included posters, slide shows, role plays along with interactive lecturettes. Each food handler was given 10 items for safe food preparation and services. These included tubs for washing fruits and vegetables with disinfectant, KMnO_4 powder, cloth napkins for wiping hands, mop cloth, wire with springs to hang these napkins, stainless steel knife, tissue paper for wiping sweat, glass tumbler to keep the knife dipped in the KMnO_4 solution when not in use, a small container for storing the disinfectant and a spoon. After the training the practices of vendors were rated in category of excellent (>80%) to poor (<29%) and these vendors who were rated as fair and above were awarded prizes to motivate them for continuation of good manufacturing practices at the laari.

The following poster entitled `20 Golden rules to food safety` was developed in A3 size as a handout, laminated and distributed to all the street food vendors during the follow up training program (Plate 4.5.12).

ભારતી પર સુરક્ષિત ખોરાક લોકો સુધી પહોચાડવા માટેના ૨૦ સુવર્ણ વગલા



- ✦ હાથ ધોવા માટે નળવાળી ટાંકી હોવી
- ✦ ખોરાકને બગાડવાથી રોકવા માટે આઈસ બોક્સ હોવું
- ✦ આઈસ બોક્સને સ્વચ્છ રાખવું અને જંતુનાશક પાણીથી ધોવું
- ✦ રોજ કિટાણુનાશક વાળુ પાણીમાં ૮ ફળ કે શાકભાજી ધોવા
- ✦ પિવા માટે બોટલ્સ/આર.ઓ. પાણીનો વપરાશ
- ✦ નખ નાનાં અને ચોખ્ખા રાખવા
- ✦ એપરન પહેરવું અને વાળ નાનાં અને ચોખ્ખાં રાખવા અને હેડ-કોપ
- ✦ લારી સાફ કરવા માટે પોતાનું પ્રબંધ રાખવું અને હાથ લુછવાં માટે અલગ પર રુમાલની વ્યવસ્થા રાખવી
- ✦ પરસેવો લુછવા માટે ટીશ્યુપેપરનો ઉપયોગ કરવો
- ✦ લારી પર એક તાર બાંધવો અને તેના પર ધોવેલા પોતા સુકાવવા
- ✦ લારી પર કોઈ પણ વાસણ ધોવું નહિ
- ✦ વધારે પ્રમાણમાં જરૂર પૂરતા વાસણ રાખવા અથવા કીસપોઝેબલ નું ઉપયોગ કરવું
- ✦ લારી પાસે એક મોટી ઢાંકણાવાળી કચરા પેટી રાખવી અને એને નિયમિત રૂપે સાફ કરવી
- ✦ હંમેશા સ્ટીલનું ચપ્પું વાપરવું અથવા કોઈપણ ચપ્પું જંતુનાશક પાણીમાં ડુબાડી રાખવા
- ✦ સકેલા ફળો/શાકભાજીનો ઉપયોગ ન કરવો
- ✦ ફળો અને શાકભાજીને ધોયા પછી વાપરવા/કાપવાં
- ✦ ખૂબ જ બળેલા તેલનો ઉપયોગ ન કરવો
- ✦ કાપેલા ફળને કે શાકભાજીને ખુલ્લા ન રાખવા
- ✦ રાંધેલા ખોરાક કે મસાલાઓને ખુલ્લા ન રાખવા










Plate 4.5.12: 20 Golden rules to food safety

4.6 MICROBIAL ANALYSIS OF FRESH CORIANDER LEAVES

Since coriander leaves were most popularly used by street food vendors to garnish the prepared food stuffs without giving any wash treatments, it was decided to determine its microbial load as well as to study the effect of 2 sanitizers on its quality.

4.6.1 Selection of markets: Five large markets from the 5 zones of Vadodara city were randomly selected for the study.

4.6.2 Sample preparation: From each market 250 g of coriander leaves were collected from 4 different vendors and were brought to the laboratory under aseptic conditions. All the coriander leaves brought from the individual markets were pooled together; inedible portions (roots) were discarded and were subjected to sanitizer treatment.

4.6.3 Sterilization of glassware: Before use, all the pipettes were kept in pipette boxes for sterilization in hot air oven at 160°C for one and a half hour. The other required glassware were sterilized in similar manner. Micro-tips were sterilized by autoclaving at 121°C for 15 min at 15lbs pressure. Blending jar and weighing balance were sterilized by cleaning with 70% alcohol and flaming them thereafter.

4.6.4 Preparation and sterilization of dilution blanks: Buffer peptone water was used as dilution blanks. For its preparation, 10g peptone, 5g of sodium chloride, 9g of disodium hydrogen phosphate, 1.5g of potassium dihydrogen phosphate were weighed. The chemicals were dissolved in small amount of water and then make the volume was made to 1 litre with distill water. It was then dispensed in portions of 225 ml into flasks of 500 ml capacity and of 15 ml tubes and sterilized for 20 minutes at 121 °C at 15lbs pressure.

4.6.3 Wash and sanitizer treatments:

Five wash treatments were tested: tap water (water supplied by the Municipal Corporation of the city), 100 ppm and 200 ppm NaOCl and 50 ppm and 100 ppm of KMnO₄. The NaOCl solutions (100 and 200 ppm) were prepared by adding 2.5 ml and 5 ml of NaOCl in one litre of tap water respectively. Solution of 50 ppm and 100 ppm of KMnO₄ were prepared by adding 50 mg and 100 mg KMnO₄ crystals in one litre of tap water.

The coriander samples were randomly selected and treated as follows: unwashed, washed in tap water, washed in 100 and 200 ppm NaOCl and washed in 50 ppm and 100 ppm KMnO₄. All washing treatments were performed by submerging the coriander leaves under the surface of the solution then manually rotating the coriander leaves (with sterilized glass rod) to ensure complete coverage and contact of surfaces with solutions for 5 mins (Plate 4.6.3).



Plate 4.6.3: Fresh coriander leaves in sodium hypochlorite solution

4.6.4 Enumeration of microorganisms:

After 5 minutes of treatment period, the samples (10 g) were then aseptically removed and transferred to sterile electric blenderizing jar containing 100 ml of buffer peptone water and homogenized for 2 minutes at high speed. The supernatant of the homogenized solution was then used to make further dilutions using serial dilution technique (FAO 1979) (Figure 4.6.4).

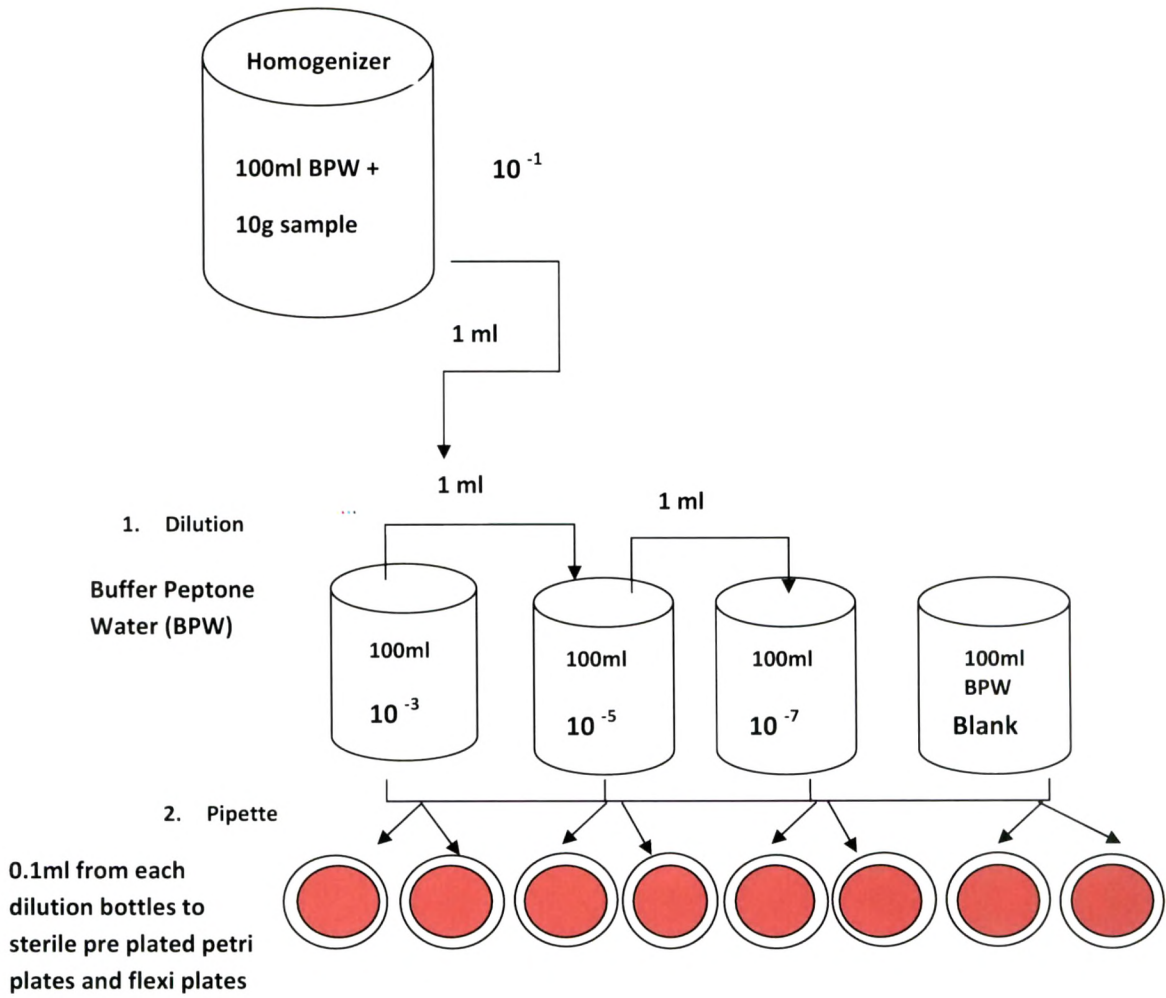


Figure 4.6.4: Serial dilution and plating technique used for microbial determination in coriander leaves

and *Shigella*, flexi plates for *Listeria monocytogenes*, coliforms and *S aureus* (Hi Media manual, 2003).

Viable counts of *Salmonella* and *Shigella* were obtained by plating 0.1 ml of sample followed by incubation at 35 °C for 48 h. The samples were plated using the spread plate technique. For the determination of *Salmonella* the samples was first pre enriched using the diluent and further enriched using Rappaport Vassilidis (RV) medium (Rappaport et al 1956 and Vassiliadis et al 1978). For the enumeration of *Staphylococcus aureus*, *Total coliforms* and *Listeria monocytogenes* 0.1 ml of sample was plated on flexi plate moulded container using the spread plate technique followed by incubation at 35 °C for 24-48 h. For obtaining the viable counts of TPC, 0.1 ml of the sample was plated using spread plate technique followed by incubation 35 °C for 24-48 h (Plate 4.6.4).

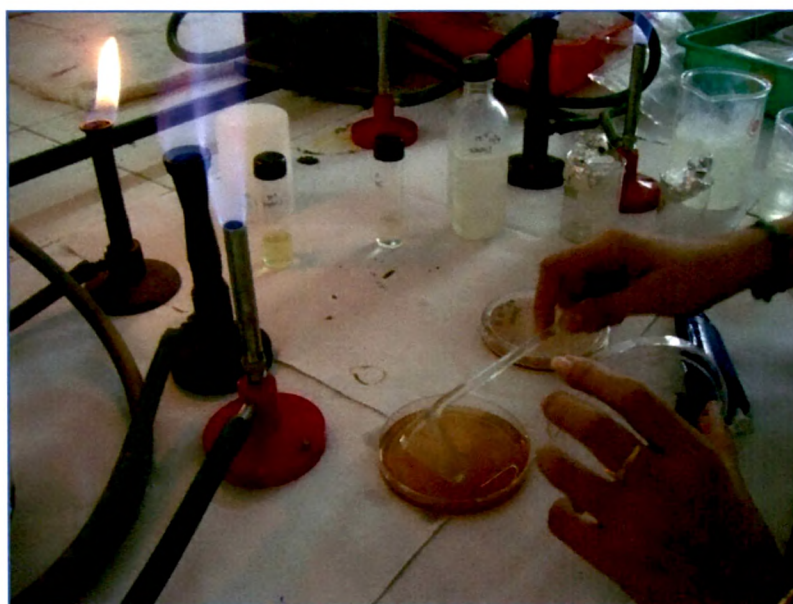


Plate 4.6.4: Spreading of sample with help of spreader

The suspect colonies were picked up and subjected to bio-chemical tests for confirmation. Confirmatory tests were carried out for *Salmonella*, *Shigella* and *E.coli* using the Triple Sugar Iron (TSI) Agar. The suspected colonies were streaked on the surface of the slant of TSI agar and were stabbed in the butt of the agar using a sterile wire loop. The test tubes were then incubated for 24

streaked on the surface of the slant of TSI agar and were stabbed in the butt of the agar using a sterile wire loop. The test tubes were then incubated for 24 hrs in an incubator. The colors of slant and butt were examined using the color change and inference chart (FAO 1979).

4.7 STATISTICAL ANALYSIS

Since the data obtained on knowledge and practices was qualitative in nature, scores were assigned to each and every response and thus the information was converted into quantitative values. Based on the individual knowledge and practice scores, the respondents were ranked into various categories such as - $\geq 80\%$ - Excellent; 65% - 79% - Good; 50% - 64% - Fair; 49% - 30% - Poor; $\leq 29\%$ - Very Poor

Data was analyzed using Microsoft Excel 2007. Means and standard deviation for all the values were calculated. F test was carried out to find out whether there existed any significant differences in their knowledge and practices amongst the various categories of food service providers as well as in the microbial counts of coriander leaves brought from five different markets. The baseline knowledge of the street food vendors of both the locations as well as owners and the food handlers was compared using Independent 't' test. The impact of the intervention on the knowledge and practice scores of the respondents was assessed with the help of Paired 't' test. Chi square test was used to test the differences in proportion. p - Values smaller than 0.05 and/or 0.01 were considered to be statistically significant.