

**SAFETY AND QUALITY OF  
FOOD FROM STREET FOOD  
UNITS IN PANAJI-GOA,  
INDIA**

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**ABOUT GOA.....**

- World famous tourist destination
- A large section of the population belonging to all age groups and all walks of life has access to street food.
- Calm, quiet and peace loving people
- Hospitable nature.
- Excellent example of religious harmony.
- No abject poverty.
- Per capita Income one of the highest in the country.



Goa enjoys a better health status compared to its Indian counterparts with a lower rate of food borne illness, which should be sustained by creating awareness on food safety.

**FAO** defines street foods as  
“Ready to eat foods and beverages  
prepared and or sold by vendors  
especially in streets and other similar  
public places”.

## Street Food Industry

- Provides significant percentage of the total food in take of millions of people in the country.
- Employs many people.
- Activities are largely unregulated.
- Can create risk to health.
- Studies on street food in developing countries show that contaminated is responsible for food illness.

**AIM...**

- To Ensure Food Safety and Quality of Mobile Street Food Units in the Capital City of Goa.

# OBJECTIVES...

1. To study the food safety practices adopted by food handlers of mobile food units with respect to sanitation and hygiene.
2. To assess the Knowledge and Attitude of the consumers of mobile street food units regarding food safety and quality.
3. To develop a training manual .
4. To impart training to the food handlers on various hygienic practices.

# METHODOLOGY

## 1. SELECTION OF .....



**FIGURE 1**

## 2. SELECTION OF CONSUMERS...RANDOM

n=120

Interviewed to assess their knowledge regarding food safety and quality.

Asked to grade the mobile SFUs

Scoring pattern	
1	Very Poor
2	Poor
3	Average
4	Satisfactory
5	Excellent

## 3. SELECTION OF FOOD HANDLERS FOR TRAINING

N=25

Chaat preparation

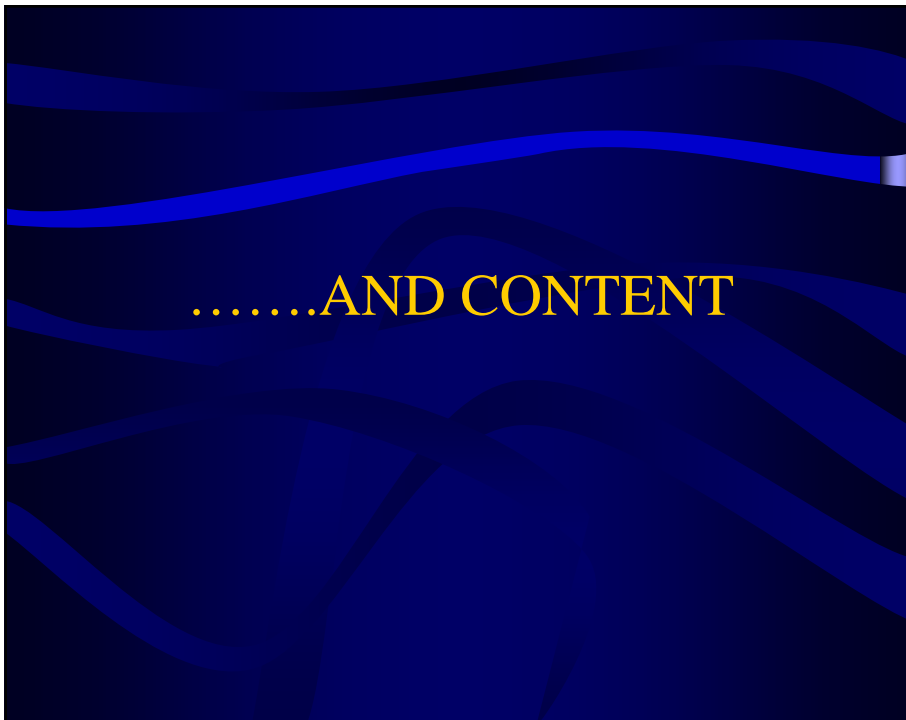
A training manual and training material developed

. The content dealt with five aspects of hygiene vital to food safety :-



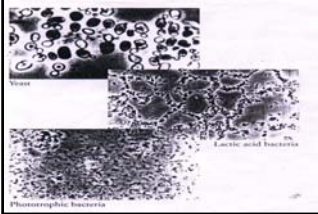


**ASPECTS OF THE TRAINING PROGRAM.....**



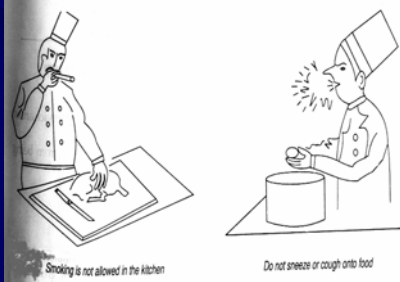
# FOOD HYGIENE

- Procurement and storage of raw ingredients
- Safe Food handling
- Use of leftover food and safe ice water for washing and drinking
- Food borne illnesses and their prevention



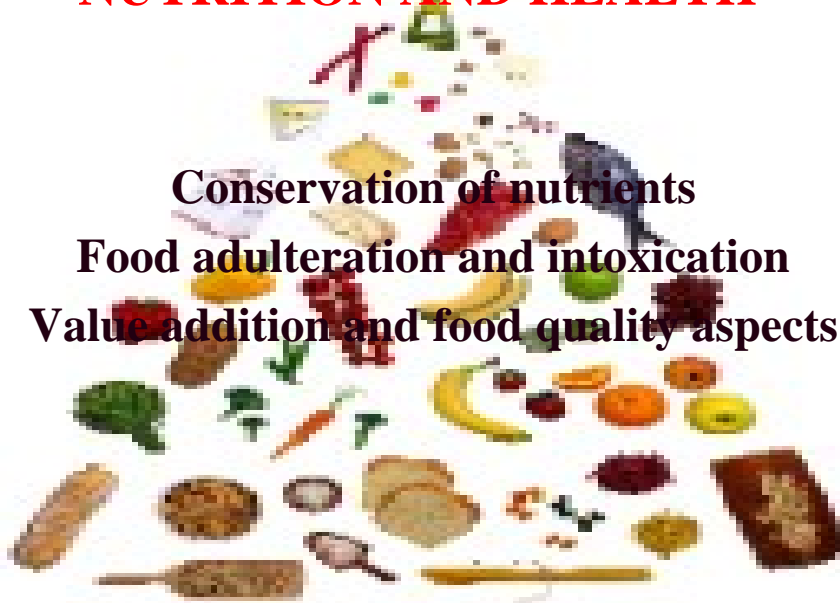
# PERSONAL HYGIENE

- Personal grooming and adoption of good habits
- Keeping yourself and your workers healthy



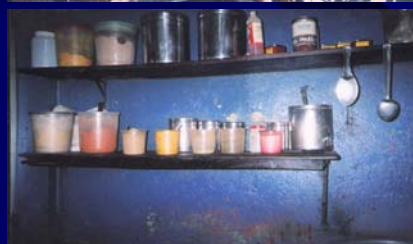
## **NUTRITION AND HEALTH**

**Conservation of nutrients**  
**Food adulteration and intoxication**  
**Value addition and food quality aspects**



## **UNIT HYGIENE**

- Basic requirements of a mobile street food unit/ roadside kiosk
- Care and maintenance of work unit and accessories



## ENVIRONMENTAL HYGIENE

General cleanliness of the immediate surroundings

Disposal of garbage and waste water



## ABOUT THE TRAINING.....

**10 training sessions**

each of 2 hours

imparted with an optimum blend of



**A post training analysis was carried out using the observation schedule.**

## **FINDINGS**

- \*CHAAT VENDING UNITS (CVUs)**
- \*SNACK VENDING UNITS (SVUs)**



Contd.

- **Hands washed with soap and water** 65%
- **Use of separate cloth for unit cleaning** 61%
- **However medical care was not given much importance**
- **Takes precaution during cough and cold** 45%
- **Takes leave and medication if sick** 17%

## Water facilities

- Water is a major problem for street food vendors
- It can lead to health risks for the consumer
- All mobile street food units used tap water for cooking and other purposes
- Water not available at vending site thus used sparingly
- 88% units provided packaged drinking water and disposable serving items
- Efforts of CCP to improve food safety

## Cleanliness of the unit

- Was found to be satisfactory
- All used soap and water to clean the unit
- Use of soap and water for washing the wiping cloth 78%
- Pest control measures followed by only 2 units

## Serving practices

- All the mobile units offered takeaway service
- Paper/plastic used as packaging material
- Serviettes provided 85%

## Procurement of ingredients and storage practices

- Food may be contaminated with pathogens and other harmful substances that can cause health problems
- Only 30% vendors considered food safety standards at time of procurement
- Only 46% vendors considered brand at the time of procurement

### Contd.

- Due to higher cost of branded, labeled and packaged ingredients
- Storage practices for raw ingredients were found to be poor due to lack of awareness and knowledge

## Hygienic practices in the kitchen are necessary to prevent outbreaks of food illness

- Study revealed unsatisfactory practices related to cooking and storage
- Cooked food held for more than 5 hours 88%
- Food covered 58%
- Leftover food stored under refrigeration 63%
- Leftover food stored under freezing 20%
- Safe thawing measures were not followed

### Contd.

- Reuse of oil 75%
- Oil filtered before use 75%
- Material used for draining oil newspaper 85%

## Environmental Hygiene of the Mobile Street Food Units

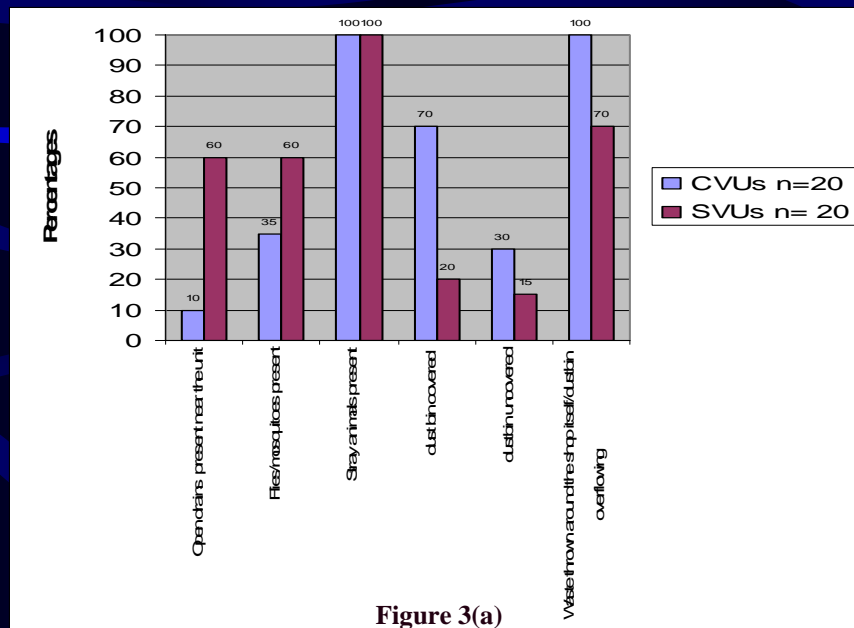


Figure 3(a)

## Contd/... Environmental hygiene of the Mobile Street Food Units

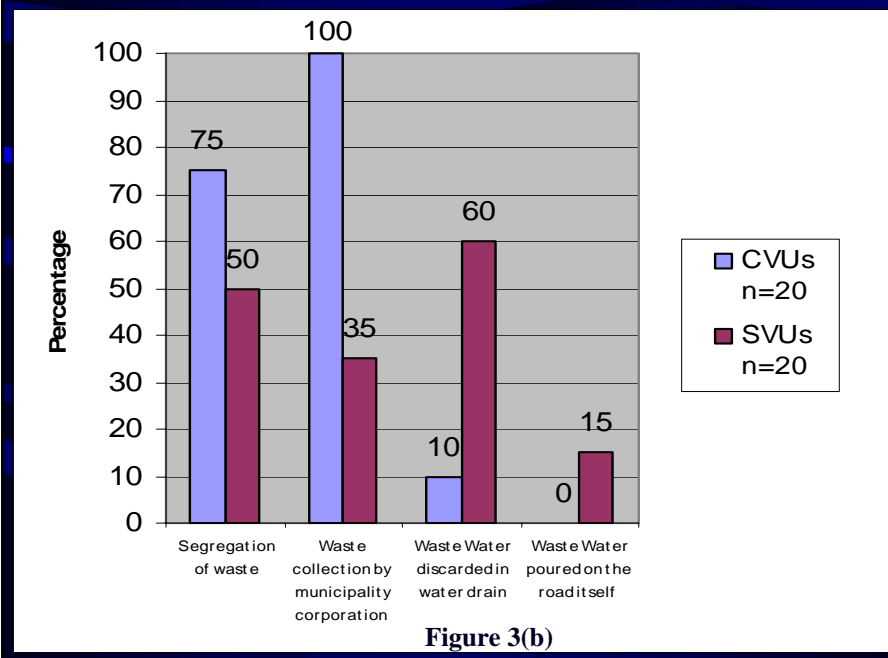


Figure 3(b)

**TABLE 1(a)**  
**Knowledge of the Mobile Street Food Handlers on Food hygiene, Unit hygiene and Nutrition**

DETAILS	SCORING PATTERN									
	CVUs n=60					SVUs n=60				
	1	2	3	4	5	1	2	3	4	5
<i>Spoiled food can cause diseases</i>	05	55				12	48			
<i>Names of food borne diseases</i>	38	22				54	06			
<i>Symptoms of food borne diseases</i>		16	44				10	08	42	
<i>Food adulteration</i>	05	50	05			04	47	09		
<i>Importance of washing hands</i>			60					60		

Contd/-

**TABLE 1 (b)**  
**Knowledge of the Mobile Street Food Handlers on Food hygiene, Unit hygiene and Nutrition**

DETAILS	SCORING PATTERN									
	CVUs n=60					SVUs n=60				
	1	2	3	4	5	1	2	3	4	5
<i>Importance of washing foodstuff</i>			18	42				16	44	
<i>Importance of Food quality standards</i>	20	22	18			35	15	10		
<i>Importance of boiling water</i>			46	14				15	45	
<i>Food storage methods</i>	13	45	2			15	42	03		
<i>Thawing procedure</i>	55	05				48	12			
<i>Care of wounds</i>		54	06				54	06		
<i>Importance of regular health checkup</i>		60					60			

**TABLE 2**  
**Knowledge of consumers on Food Safety**

DETAILS	SCORING PATTERN n=120				
	1	2	3	4	5
<i>Personal hygiene</i>		45	50	25	
<i>Food hygiene</i>	45		60	15	
<i>Unit hygiene</i>	32		88		
<i>Environmental hygiene</i>		05	98	17	
<i>Nutrition</i>	16	34	48	16	06
<i>Adulteration</i>		24	72	14	06

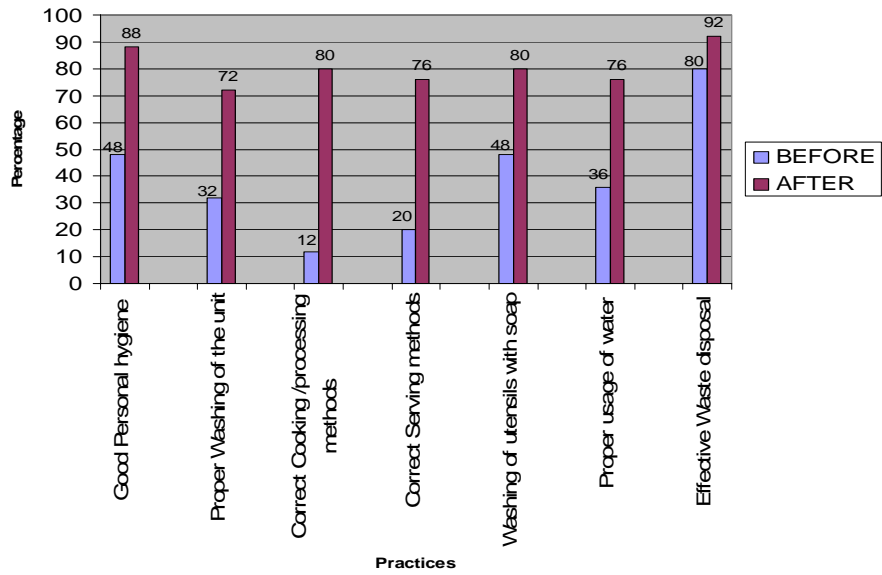
SCORING PATTERN

1	VERY POOR
2	POOR
3	AVERAGE
4	SATISFACTORY
5	EXCELLENT

**TABLE 3**  
**Rating accorded by the Consumers to Mobile Street Food Units**

DETAILS	SCORE PATTERN									
	CVUs n=60					SVUs n=60				
	1	2	3	4	5	1	2	3	4	5
<i>Personal hygiene</i>			36	24				40	20	
<i>Food storage</i>		18	42				16	44		
<i>Unit hygiene</i>			20	40			15	45		
<i>Taste of food served</i>				52	08				50	10
<i>Water used for drinking</i>			05	10	45			10	05	45
<i>Waste disposal</i>		10	16	34			15	37	08	
<i>Environmental sanitation</i>			45	15				48	12	

**Figure 4** IMPACT OF TRAINING ON FOOD HANDLERS



**IN CONCLUSION....**

- Food handlers followed only certain personal hygienic practices, however medical and health care was not accorded much importance.
- Unit hygiene was found to be satisfactory, however only 2 units followed pest control measures.
- The practices related to cooking and storage was unsatisfactory.

- Overall environmental sanitation at the vending sites was found to be satisfactory; however measures to improve the conditions are essential.
- Food handlers had poor knowledge of food quality and food safety.
- Most of the consumers were found to have average knowledge of environmental hygiene; however they were not aware of the food borne diseases that could occur due to poor environmental conditions.

- It has been well recognized that one of the weakest links in intervention programs to control street food safety is lack of awareness, knowledge and training.
- The food handlers were responsive to the training as revealed by the implementation of good hygienic practices by majority of the food handlers.
- However there is vast scope for improving food quality and safety.





**TABLE 4(a)**

**Personal hygiene and health care practices adopted by the Street Food Handler**

DETAILS	NO.OF FOOD HANDLERS n=120		
	CHAAT VENDING UNITS (n=60 ) %	SNACK VENDING UNITS ( n=60 ) %	Total % (n=120)
<i>Wearing clean clothes</i>	83	80	82
<i>Wearing protective clothing</i>	33	42	38
<i>Hair neatly cut and combed</i>	75	80	78
<i>Nails cut and clean</i>	62	58	60
<i>Hands washed before starting days work with soap and water</i>	92	63	56

Contd/-

**TABLE 4(b)****Personal hygiene and health care practices adopted by the Street Food Handlers**

DETAILS	NO. OF FOOD HANDLERS n=120		
	CVUs (n=60) %	SVUs (n=60) %	Total % (n=120)
<i>Hands washed with soap and water after using toilet</i>	67	65	<b>37</b>
<i>Hands washed after completing cooking with soap and water</i>	58	32	<b>62</b>
<i>Use of separate hand towel for wiping hands after washing</i>	57	53	<b>59</b>
<i>Separate hand towel used for sweat and nose</i>	60	67	<b>63</b>
<i>Hand towel kept in pocket/ on shoulder</i>	80	58	<b>69</b>

Contd/-

**TABLE 4(c)****Personal hygiene and health care practices adopted by the Street Food Handlers**

DETAILS	NO.OF FOOD HANDLERS n=120		
	CVUs (n=60) %	SVUs (n=60) %	Total % (n=120)
<i>Use of separate napkin for unit cleaning</i>	60	62	<b>61</b>
<i>Covers wounds immediately.</i>	38	45	<b>41</b>
<i>Takes precaution during cough and cold</i>	40	50	<b>45</b>
<i>Takes leave and medications if sick</i>	20	13	<b>17</b>

<b>TABLE 5 (a)</b>			
<b>Water facilities, Cleaning and Serving Practices</b>			
<b>DETAILS</b>	<b>NO.OF STREET FOOD UNITS n=40</b>		
	<b>CVUs (n=20) %</b>	<b>SVUs (n= 20) %</b>	<b>TOTAL % (n=40)</b>
<i>Use of unboiled tap water for drinking</i>	00	25	13
<i>Use of packaged water for drinking</i>	100	75	88
<i>Use of tap water for cooking</i>	100	100	100
<i>Frequency of cleaning the unit</i>			
<i>a.once a day</i>	60	75	67
<i>b.twice a day</i>	40	25	33
<i>Use of soap and water in cleaning unit</i>	100	100	100

Contd/-			
<b>TABLE 5 (b)</b>			
<b>Water facilities, Cleaning and Serving Practices</b>			
<b>DETAILS</b>	<b>NO.OF STREET FOOD UNITS n=40</b>		
	<b>CVUs (n=20) %</b>	<b>SVUs (n= 20) %</b>	<b>TOTAL % (n=40)</b>
<i>Use of soap and water for washing the wiping cloth.</i>	70	85	78
<i>Pest control measures followed</i>	00	10	05
<i>Drying of wiping cloth</i>	25	40	33
<i>Use of stainless steel cutlery and crockery</i>	60	75	68
<i>Use of chopping board</i>			
<i>a. wooden</i>	10	20	15
<i>b.fibre board</i>	20	15	18

Contd/-

**TABLE 5 (c)**  
**Water facilities, Cleaning and Serving Practices**

DETAILS	NO.OF STREET FOOD UNITS n=40		
	CVUs (n=20) %	SVUs (n= 20) %	TOTAL % (n=40)
<i>Use of soap and water for washing cutlery and crockery</i>	100	100	<b>100</b>
<i>Used plates or glasses washed dipping in same water frequently</i>	00	15	<b>08</b>
<i>Take away service</i>			
<i>a. served in paper</i>	40	75	58
<i>b.served in plastic</i>	60	25	43
<i>c.served in aluminium moulds</i>	00	00	<b>00</b>
<i>Use of disposable plates and glasses for serving</i>	100	75	88
<i>Serviettes provided</i>	100	70	85

**TABLE 6**  
**Procurement of ingredients and storage practices**

DETAILS	NO.OF STREET FOOD UNITS n=40		
	CVUs (n=20) %	SVUs (n= 20) %	TOTAL % n=40
<i>Cost considered while Procuring ingredients</i>	100	100	<b>100</b>
<i>Brand name considered while Procuring ingredients</i>	05	42	<b>48</b>
<i>Food quality standard considered</i>	30	30	30
<i>Both Cost and brand considered while Procuring ingredients</i>	20	10	<b>15</b>
<i>Ingredients stored</i>			
<i>a. packaging material itself</i>	60	75	<b>68</b>
<i>b.Steel containers</i>	65	50	58
<i>c.plastic containers</i>	75	80	78
<i>Use of refrigerator</i>	75	90	83
<i>Vegetables washed and stored</i>	45	50	<b>48</b>

**TABLE 7 (a) Cooking and storage practices of food adopted by the Mobile Street Food Vendors**

DETAILS	NO.OF STREET FOOD UNITS n=40		
	CVUs (n=20) %	SVUs (n= 20) %	TOTAL % n=40
<i>Washing of ingredients before use</i>	75	70	73
<i>Use of fuel</i>			
<i>a..kerosene</i>	100	100	100
<i>b. Gas</i>	00	00	00
<i>Chopping of vegetables much in advance in bulk</i>	100	100	100
<i>Food covered</i>	50	65	58
<i>Cooked food stored in refrigerator</i>	0	0	0
<i>Certain food items prepared at home</i>	100	100	100

Contd/-

**TABLE 7(b)****Cooking and storage practices of food adopted by the Mobile Street Food Vendors**

DETAILS	NO.OF STREET FOOD UNITS n=40		
	CVUs n=20 %	SVUs n= 20 %	TOTAL % n=40
<i>Holding of cooked foods for &gt;5hrs</i>	100	75	88
<i>Hot foods served hot</i>	75	70	70
<i>Left over food stored under</i>			
<i>a.frozen</i>	20	20	20
<i>b. refrigeration</i>	55	70	63
<i>Left over food used</i>	40	30	35
<i>Reuse of oil</i>	60	90	75
<i>Used oil filtered</i>	60	90	75
<i>Material used for draining oil</i>	80	90	85
<i>a.newspaper</i>	20	10	15
<i>b.brownpaper</i>	00	00	00
<i>c.whitepaper/tissue paper</i>	00	00	00
<i>d.banana leaf</i>	00	00	00