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## **FOOD SAFETY IN PUBLIC CATERING**

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## Food Safety at ICRISAT Center

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ICRISAT is a non-profit, scientific, agricultural research and training institute receiving support from donors through the Consultative Group on International Agricultural Research. Donors to ICRISAT include national governments and international agencies.

### The Importance of Food Safety Systems

Because of rapid industrialisation and changing life styles, large-scale catering services which prepare and distribute food to the public have vastly increased. An unfortunate consequence of this development is the increasing incidence of foodborne disease. Although food technology methods have improved, similar advances in hygienic techniques have not been brought about in the subcontinent. Before setting up a catering unit, it is essential to fully understand the importance of food hygiene and the ways in which hygienic considerations affect the running of a kitchen. The aim should always be to ensure that only safe food is served.

To achieve food safety in institutional catering, food should not only be clean in the ordinary sense, but free of contamination. The likelihood of incidence of foodborne illnesses or poisoning is enhanced when food is prepared, cooked, and distributed on a large scale. High standards are therefore essential at all stages of food production (i.e. receiving of raw materials, storage, preparation and distribution of finished products).

### Food Services at ICRISAT

Food Services at ICRISAT is a non-profit, self-sustaining unit. In order to cater to the complete needs of the Institute, the unit's infrastructure is large. Food services must handle the food requirements of national and international staff, short and long-term trainees, interns, research scholars, and visiting scientists. It must also cater to the needs of visitors, including Heads of State and other dignitaries from all over the world. Food Services is also responsible for all food activities for national and international workshops and seminars. Its primary objective is to provide high quality food and good service at low cost.

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ICRISAT has three large halls and a snack bar at the swimming pool. A variety of Indian, Western and Southeast Asian food is served to suit both local and foreign tastes. The dining centres are designed with self-help cafeteria service with both a la carte choices or preplated fixed meals. Apart from the routine cafeteria operation, special events are catered, such as formal banquets, luncheons, dinners, and tea/coffee snacks in connection with the workshops/seminars and visits of dignitaries. These events demand personalised service.

An Assistant Manager in charge of 65 personnel is responsible for the effective running of the Food Services Unit. He reports to the Manager of Housing and Food Services.

### Special Problems

Various problems in institutional catering are:

- catering to different tastes and habits, meeting daily deadlines, and maintaining quality at low cost;
- constant access to suitable raw material;
- non-availability of trained manpower and unhealthy personnel practices

### The Layout of the Food Production and Service Area

ICRISAT's food production area was designed with four basic aims:

- economy of operation time;
- economy of efforts;
- production of safe food; and
- cost effectiveness.

The three dining centres and the poolside snack bar are situated in three separate buildings. Three well-equipped kitchens, which prepare and serve different types of meals, are attached to the dining centres. Maximum care is taken to maintain a high standard of hygiene in the layout and selection of equipment. There are separate areas away from the main cooking areas for preparation of vegetable, fish, meat, and poultry. The dish washing facilities are separate from the main preparation and cooking areas, and include hot and cold water pressure sprays(75 psi) and stainless steel sinks and racks. There are separate areas for baking preparation of cold food. Stereo dishwashing machines have been installed to clean cutlery, crockery, and glassware (initially at 50-60° C and a spray at 70-80° C).

All work tables, shelves and cupboards are made of stainless steel. The main kitchen which services 600 lunches daily, has been installed with a 10,000 litre solar water heater which reduces the cost of electricity. It provides ample water heated to 60° C.

The kitchens are well ventilated with evaporative cooling systems which allow a constant flow of fresh air into the kitchen. Cross ventilation is well maintained. For kitchen exhaust, a steel canopy is provided with large exhaust fans over the main cooking area, the baking oven and the dishwashing machines. The kitchen wash area walls are tiled to the ceiling and the floors have non-slippery tiles.

Two dining centers with individual kitchens are air-conditioned. An adequate drainage system is provided. Potable drinking water is available through ICRISAT's water filtration plant and bacteriological tests are carried out regularly. Separate walk-in coolers and deep freezers are provided. All doors leading to the outside are fixed with aircurtains to prevent intrusion of insects, odour, dust, etc.

### Equipment

Maximum output and smooth flow of work are the main factors determining the types of equipment and their positioning. Optimal use can only be achieved if all equipment functions efficiently. Continuous maintenance is therefore critical.

The use of high standards of equipment in our service centers is justified for four reasons.

- Labour costs remain low
- Reliable performance is guaranteed.
- We can keep pace with demand.
- Hygienic conditions during food preparation are maintained.

#### Basic Questions to Ask when Preparing a List of Equipment

- How many people are to be served ?
- What sort of meals are to be served ?
- What length of service is required and at what times ?
- What quantities of food are needed ?
- What types of equipment are available ?

Our production areas and the dining halls are well equipped (e.g. heavy duty dough mixers, electric potato peelers, meat chopping machines, braising pans, jacket boilers, high pressure and low pressure burners, salamander boilers, grillers, baking ovens, thermostat-controlled stainless steel hot cases, micro-ovens, cold pans, bains-marie, slicing machines, etc., from Hobart, Groen, Berkel, South Bend, etc.).

Garbage in plastic bags is placed in heavy duty plastic bins and kept in a refrigerated garbage room (1.5-4.5° C), which is cleared regularly by the Institute's Janitorial Services Unit.

The dining hall serving counters are made of heavy stainless steel.

They are fixed with bains-marie, infra-red heating shelves, refrigerated cold pans, beverage dispensers, egg boilers, electric conveyor toasters, and micro-ovens. All ice cube machines and drinking water coolers are fixed with additional water filters (i.e. EC111-EC10 Everclear cold water dirt/rust filter cartridges and 9795-21 EC10 Everclear cold water dirt/rust filters).

### Procurement of Raw Materials and Storage

The success of a catering establishment depends to a very great extent on its procurement. Other contributing factors are a suitable and flexible pricing structure, the standard of cooking preparation, presentation, efficient and economic staffing, and avoidance of wastage. When processing raw materials, we try to obtain the best possible value for our money.

The Assistant Manager, Food Services Unit is responsible for procuring quality supplies with the help of the Purchase and Stores Division. Although Institute has a Central Receiving Store, the Food Service Stores functions separately under the Assistant Manager. This arrangement assures that all supplies are received directly. Quality can thus be checked and the goods weighed at the point of receiving and unsatisfactory items can be returned to the supplier. Since the Center is situated about 35 km. from city, sufficient storage space for a 15-day stock of dry stores and perishables is provided. Due care is taken to store vegetables, meat, fish, eggs, and dairy products separately in individual walk-in-coolers. All vegetables are cleaned and stored in food grade polythene bags and are procured twice a week. Milk and cream are procured daily. Pasteurised milk purchased from A.P. Dairy are frozen in sachets to maintain a buffer stock. Fifteen-day stocks of meat, fileted fish, and poultry are stored in plastic bags with dates and labels (i.e. Indian, Western, Tandoori etc.), and kept separately in freezers at -12° C. Eggs are procured directly from a poultry farm thrice a week and stored in a walk-in-cooler. Efforts are made to procure meat, fish, and poultry from good suppliers with high hygienic standards. Long shelf life vegetables such as potatoes, onions, ginger and garlic are purchased once every 15 days. Cooking oils are purchased directly from manufacturers.

All foods are stored in polythene bags and crates on stainless steel racks above the floor. To use the stored food, the "first-in-first out" (FIPO) method is used. A constant watch is kept by the catering officer of the unit, who discards any deteriorated foods.

Frequent market surveys are carried out by the Assistant Manager of raw material purchases. Suppliers shops are visited to check quality and availability.

## Food Preparation

While preparing the food, care is taken to avoid contamination. All vegetables and fruits are sanitised and washed/rinsed under cold water before serving. Meat, fish, and poultry are thawed separately overnight in the chef's walk-in cooler.

The next day's menu items are stored under proper cover in walk-in coolers at 1.5 to 4.5° C. Poly-top butcher's blocks on stainless steel are used for carving. The blocks are cleaned and sanitised after each use. All knives are washed immediately after use. Discarded meat membranes, internal organs, and bones are quickly transferred to garbage bins and stored in the refrigerated garbage room. All working surfaces are constantly cleaned by the cooks with washable coir pads.

## Cooking

Care is taken that all raw ingredients are cooked fully at the right temperature. All ovens are thermostat-controlled to ensure correct temperature. High pressure burners giving 2,70,000 BTU/hr are used to cook large quantities of food quickly. With the help of physical plant services engineers, efficiency in running this equipment is ensured. After cooking, the hot food is transferred to bains-marie for service.

## Service

Foods are prepared a half hour before serving. Cafeteria food is portioned on plates from bains-marie 15-30 minutes before actual service time. Trays are kept in heated trolleys for preplated fixed meals. For pick-and-choose self help counters with varied menu choices, main dishes are portioned in batches of 15 plates 15 minute before serving using the portion scales. Cereals, sauces, soups, etc. are kept in bains-marie at the counter for serving. Desserts, curd, salads, and cold meat are kept in refrigerated cold pans and beverages in refrigerated dispensing machines.

Another feature designed to save waiting time in the queue is the daily special menu (i.e. Chinese, western or southeast Asian food) which is served at the table within 10-15 minutes straight from the kitchen. Buffets can be set up in the Executive Dining Room with self-heated chafing dishes for groups of more than 15 persons.

In the dining halls, hot dishes are kept in thermostat controlled stainless steel hot cases and then displayed on heated stainless steel shelves for self-service. All the counters are designed with laminated wood and signs are displayed to promote healthy food practices.

## Hygiene

ICRISAT's Food Services Unit is situated in ideal hygienic surroundings. We believe that continuous maintenance of the facilities and equipment and rigid compliance with the rules of personal hygiene are necessary in the preparation of safe food in any institutional catering unit.

Our food production areas are situated far from garbage, food receiving, washing-up areas, and staff restrooms. Only uniformed food services staff are permitted in the food production areas. Cleaning personnel constantly keep the floor and work surfaces clean by constantly picking up, sweeping, and mopping with disinfectants. All equipment is maintained in a clean and safe condition. Floors and work tables are cleaned with soapy water and floor-scrubbing machines daily. Apart from routine cleaning, a special cleaning schedule of a particular area is undertaken daily. The catering supervisor, the chief cook, and the senior head waiter are responsible for these daily cleaning operations.

All food handlers in constant touch with food are potential sources of food contamination. We ensure the following steps in order to maintain high standards of personal hygiene.

1. Medical certificate at the time of employment.
2. Compulsory medical check-ups every 6 months at the ICRISAT Medical Unit, including inoculation against typhoid, para-typhoid, and cholera.
3. Proper restroom and toilet hygiene.
4. Daily spot checks and adequate hygiene talks to educate food service staff and their families.
5. Medical fitness certificates for absence due to sickness exceeding 3 days.
6. Periodic medical screening of all food handlers, including stool and blood samples.

All food handlers are issued protective clothing, including caps to prevent hair falling on the food. We have a well-equipped laundry which cleans staff uniforms and linen.

Food Services staff are provided with an air-conditioned restroom with individual lockers. They are also provided with exclusive toilet facilities. The Catering Officers play a vital role in maintaining clean working areas and hygienic working habits. They ensure daily briefing of staff and carry out spot personal hygiene checks.

## Food Handlers and Training

No matter how good facilities may be, results will not be obtained unless staff are efficient and willing to work together. A productive and efficient staff can only be assured through constant training at all levels. We must educate our personnel and their families on good habits and healthy practices. Food Services maintains constant vigilance with talks on hygiene and good habits. Training handouts in regional languages on hygiene kitchen production and service are distributed. Slide shows and video programmes on hygiene are also shown.

Our Resident Doctor periodically lectures on hygiene and the importance of healthy practices in food handling to all the food handlers in small groups in regional languages.

## Pest and Rodent Control

ICRISAT has a continuous pest and rodent control program for our service centres. There is an institute-level Technical Advisory Committee on Pest and Rodent Control which advises us regularly. We ensure that no food scraps are left lying out. No dirt or rubbish is allowed to accumulate. All holes, gaps, drains, and air ducts are covered with thick wire mesh or grating. Doors and windows are screened and the doors are fitted with self-closing devices. Paint used contains insecticides. Electronic flycatchers and Sinitron-C ultrasonic rodent control transmitters are installed in the kitchen, store rooms, and receiving area. Monthly spraying schedules are followed in the kitchen and dining areas.

Signs of rodent infestation are the presence of droppings, greasy foot prints, damage to stock, and rat odour. Continuous war must be carried on with baited traps and tracking methods to ensure that rodents are not present in food areas. The Institute's Plant Protection Unit helps us to control pests and rodents on a continuous basis.

## Quality Control

All storage areas are checked regularly and care is taken not to store any item on the floor. Heavy duty plastic containers with tight lids are used to store grains. The containers are on wheels for easy movement. All refrigerated walk-in coolers and deep freezers are fixed with external dial temperature meters to ensure that food is stored under proper temperature. All vegetables, once cleaned of dirt and damaged parts, are kept in food grade plastic bags on shelves. At the time of receiving, samples are checked at random for quality and other specifications by the Assistant Manager, Food Services.

In the kitchen, vegetables are sanitised and rinsed in cold water before cutting. Separate cutting boards are used for vegetables, raw meat, fish, and poultry. Separate poly-pop butchering tables are used for each type of meat. Only stainless steel knives are used. After cutting meat, fish, or

poultry, the knives are sanitised. No food is left uncovered or left outside overnight.

All meat, fish and poultry is thawed in the chef's cooler overnight. The quantity prepared depends on demand. Leftover meat, fish, vegetables and sauces containing milk, cream, or eggs are discarded. Leftover food is transferred to clean containers and stored in refrigerators. It is used in stews, casseroles, or salads at subsequent meals.

Immediately after preparation, hot food is transferred to bains-maire for serving/portioning. Cold food is placed in refrigerators to await further preparation or in the refrigerated cold pans for service. Our dining hall service times are fixed to a maximum of 2 hours. Food service staff are allowed to eat any leftover vegetarian food. Pastries, rolls, and buns are stored under cover immediately. No leftover soups containing starch are stored or refrigerated more than 6 hours. Any stock or basic sauces not containing flour, cream, or eggs is stored after quick cooling in the refrigerators or walk-in coolers in clean containers with lids.

It is ensured that raw foods are kept on separate racks from cooked food in the refrigerators or walk-in coolers to prevent cross contamination.

All staff must wash their hands in potassium permanganate solution before going on duty and after visiting the toilets.

Recipe specifications with details of cooking time, temperature, etc. are given to the cooks to follow. The Unit also takes on official outdoor catering functions. Care is taken to prepare the food on the spot. Half-cooked food in suitable containers in insulated ice chests is transferred an hour before service time and served after final preparation.

ICRISAT management encourages high standards of service and good hygienic practices. The Manager, Assistant Manager, and Canteen Officers are qualified professionals responsible for maintaining these standards. The food service staff in ICRISAT enjoys good pay, benefits, and other facilities.

## Conclusion

No outbreaks of foodborne disease have ever occurred at ICRISAT. The challenge of maintaining high standards and personal hygiene is most difficult when casual labourers are hired during heavy food activities. It is very difficult to obtain trained or skilled food handlers for short time. Casual workers are rarely trained in basic hygiene practices; largely because of ignorance on the part of former employers. The government should undertake to educate all food handlers in basic hygiene practices by involving the media (i.e. newspapers, TV, radio, public lectures and displays) and by encouraging all institutes of hotel management or food preparation to develop suitable short certificate courses. Preparation and distribution of simple handouts for the easy understanding of ignorant food handlers would dramatically improve the present situation.