

Air line hygiene in civil aviation: Jet Airways' perspective

by

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ABSTRACT

Jet Airways is not only the largest private domestic airline in the country, but also the most preferred one. It offers highest levels of service on par with international standards. In the 80 odd years since the inception of Civil Aviation, air travel has developed its own inherent hygiene related problems, the aircraft being a good vehicle for transmission of infection. We have discussed procedures followed by Jet Airways for maintenance of airline hygiene such as aircraft catering, aircraft drinking water, cabin air quality, disposal of food, dry and human waste and aircraft pest control. Thousand of staff toil round - the - clock to present the passengers with clean, hygienic, disease free, well appointed cabins.

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In the 80-odd years of commercial aviation, flying has become routine and very few people boarding an aircraft consider it to be a vehicle of infection. Air travel however, has introduced its own special hygiene problems by way of food and water-borne disease, waste disposal & transmission of illness by flying insects/rodents. It is thus incumbent on us to safeguard crew / passengers from these iatrogenic health hazards.

Jet Airways is truly a world-class airline. Not only is it the largest private domestic airline in our country, but also the most preferred one, offering the highest levels & quality of service of world class standards, on par with the best international airlines. The procedures and practices followed by Jet Airways to ensure the highest standards of Airline Hygiene will be discussed under the following heads:

Aircraft catering

Aircraft drinking water

Cabin air quality

Disposal of waste

Aircraft pest control

Cleaning / disinfection

Carriage of pets

Aircraft Catering

In-flight catering is provided by Taj-SATS Air Catering Ltd. (TSACL), which is a HDCCP (Hazard Analysis Critical Control Points) certified unit.

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operating custom-built premises adjacent to the airport. Food hygiene in TSACL is given **TOP PRIORITY** - there is absolutely no compromise to satisfy operational / commercial targets. Stringent standards of quality & sanitation are enforced at all points - this includes purchasing, receiving, storage, preparation, holding, delivery & final service on board. All operating principles of Hazard Analysis Critical Control Points (HACCP) are adhered to & all qualitative standards met. Regular audits of systems / procedures in use and of environmental hygiene are undertaken frequently and meticulous records are maintained.

Meals served on board are of high gastronomical quality, pleasing to the eye & acceptable to the taste. All food is hygienically prepared, is totally free from any bacteria / toxins and is stringently monitored for contamination. Microbiological examination of all food products (raw samples, during processing / handling, end products) is done on regular basis.

A flow pattern ensuring separation of raw from cooked products and clean from dirty equipment, is provided through the premises. The kitchen design provides hard surfaces that can be well-maintained and cleaned. Single piece cutting boards made of synthetic material are used in preference to the less hygienic wooden ones. Meticulous cleaning and sterilization of all equipment / surfaces coming into contact with the food is ensured at all times.

Potable water, efficient drainage and waste disposal systems are present. All disposable catering items (piping bags, gloves, head covers) are used. A Meiko ware-wash system, which maintains a dual rinse temperature of 82° C, is present. All salad items are washed in hypochlorite solution containing 50 p.p.m. of available chlorine. Ice cubes are made in ice-cube machines using chlorinated water and supplied in sealed bags.

All meals are stored at temperatures less than 10° C. Hot meals are "blast chilled" to less than 5° C, and handled as cold meals from the flight kitchen to the aircraft where they are stored between 2° to 7° C. These are then reheated in ovens to 73° C at time of serving. Meals which are not served within the prescribed time limit (4 hours without refrigeration), are destroyed. Menus exclude high-risk foods e.g. sea-foods (shellfish), cold meats, food with raw eggs, fresh cream, mayonnaise. The pilot and co-pilot always eat different menus, as per standard regulations. As transportation to the aircraft poses problems in hot climates, dry ice is used to maintain tray setups and meals at recommended temperatures.

Food handlers are made aware of the importance of personal / food hygiene and washing of hands with bactericidal soap, is mandatory. All food handlers (including Cabin Crew) undergo pre-employment medicals, which includes stool examination. Fitness to resume duty after any illness is given **ONLY** after relevant tests have been carried out. Audits of personal hygiene (including bacteriological examination of finger swabs and stool samples), are conducted regularly. In cases of suspected food poisoning, the cabin crew record details of food / drink consumed by the affected passenger in the previous 24 hours, including the time of consumption and onset of symptoms. Suspected food samples are immediately collected and sent for laboratory tests.

Airport restaurants and hotels accommodating crew should be inspected regularly to ensure that the highest standards of hygiene are maintained and risk of food poisoning / associated infections (drinking water, swimming pool), is minimized.

Aircraft Drinking Water

Drinking water (pre-chlorinated by sodium hypochlorite/ Chloramines-T at 16 p.p.m.) is stored in large-capacity reinforced fiber-glass storage tanks, which are in-built into the aircraft structure. From

here, it passes by gravity or is pumped to the galleys, sink taps, wash basins and drinking points. The water is supplied via a "fill point" on the plane belly by water tankers. A single system supplies all water required for catering, drinking, hand-washing, toilets, etc. in other words all the water is potable. A system of dual water supply is not followed. Water which is supplied to the galleys passes through additional, charcoal-type filters, which are in-built in the aircraft. Random checks are done for the water chlorine content at user end.

Frequent bacteriological examination of water from aircraft catering unit, aircraft water bowsers, fill-points for bowsers, tanks, is done in accordance with the WHO Standards of Purity, 1984. At maintenance checks, water bowsers, delivery hoses, pumps, pipes, fill-points, tanks are sterilized by hyper chlorination at 15. p.p.m. At major checks, all tanks are removed for scouring, steaming, complete over-hauling, and finally sterilizing. Delivery taps are cleaned, sterilized, and protected with polythene covers till they can be delivered to the aircraft.

Only standard Mineral Water brands are served for drinking' on all Jet Airways flights. A chlorinating agent (Chloriwat) is kept in the First Aid Kits carried on board, for use in case of emergencies.

in future, provision of mains water supply points at all aircraft parking bays will eliminate the need for water bowsers.

Cabin Air Quality

The Environmental Control Systems on all Boeing Aircraft are designed to meet / exceed FAA Requirements (FAR 25. 831), and also satisfy all health guidelines set by organizations like OSHA and ACGIH. Some guidelines for air distribution are as under :

10 CFM fresh air ventilation and 20 CFM total air ventilation/ passenger

Ventilation Systems provide approximately 50% fresh air and 50% recirculated air to the cabin

There are about 20-30 total air changes / hour for the passenger cabin and 80 changes / hour for the flight deck, after passing through HEPA filters, this being more effective and superior to air-conditioned offices (12 times / hour) or Operation Theatres (20 times / hour)

The Temperature and Relative Humidity are maintained at recommended levels

Levels of bacteria / fungi measured in cabin air are well below the levels accepted, (as per US DOT study in 1989).

Disposal of Waste

Airlines Waste comprises the following :

1. Food Waste - This leaves the aircraft on meal trays to the flight catering unit where it is disposed off by incineration.
2. Dry Waste - Paper, peanuts, etc. deposited in the cabin during the flight, are collected by aircraft cleaners at the end of each sector, placed in polythene bags and then disposed as per airport waste management systems.
3. Human Waste - This is collected; in tanks on board the aircraft. Toilets are serviced at each stop emptied, flushed and then refilled to preset levels with a mixture of water and a colored, aromatic, quaternary ammonium bactericidal compound in water-soluble sachets, so as to disguise the toilet contents. Pathogens are killed in 15 minutes at 18-20° C. This is effective at 1:400 dilutions in a fully loaded toilet and can also liquefy solid material and tissues. Toilet contents are disposed off a in the airport sewage system at disposal blocks provided with wash-down facilities and macerator / coarse screen, to remove all solids. Care is taken that staff / others are not exposed to any risk. Staff handling toilet

waste DO NOT handle aircraft water supply during the same shift.

Classic Aircraft have self-contained toilets with large holding tanks (similar to chemical closets) situated directly below. Flushing is provided by recirculating the liquid contents after filtration of solids. NG Aircraft have "Vacuum Toilets"- flushing occurs due to a pressure differential outside the aircraft. Toilet contents, together with a small amount of water are sucked down a pipe to holding tanks which contain the same bactericidal disinfectant, and are situated in the rear of the aircraft. Classic Aircraft have stainless steel toilet bowls whereas NG Aircraft have toilet bowls with non-stick Teflon-coated surfaces, so as to minimize the water needed to keep them clean and hygienic.

Aircraft Pest Control

Aircraft can harbor / carry numerous pests (rats, mosquitoes, cockroaches), which may be disease -carrying or prove harmful to aircraft fabrics.

Disinsection

This is defined by IHR, 1969, as an operation in which measures are taken to kill the insect vectors of Human Disease in ships, aircrafts, trains, etc. It states that every aircraft leaving an airport situated in an area where transmission of malaria / other mosquito-borne disease is occurring or an airport having vector species that has been eradicated in the destination airport, shall be disinsected. A WHO specified aerosol which is harmless to humans, does not damage aircraft materials (structural / otherwise), and does not interfere with aircraft systems/ equipment, is used. There are 2 Methods of Disinsection -

(a) Blocks Away or Knockdown Method - Disinsection is carried out by spraying of the passenger cabin and all other accessible interior spaces of aircraft, following embarkation but prior to take-off, with the cabin ventilation systems switched

off. Single-use, hand-operated aerosols containing enough insecticide (synthetic parathyroid group) to discharge IOg / 1000 eft (35 gms/100 m³), are used by cabin crew. The exact number of aerosol cans required can be determined by the interior volume of the aircraft. These are serially numbered and handed over to Airport Health Authorities at the arrival airport. The flight deck, wheel wells and cargo hold are also sprayed prior to take-off. This method is usually reserved for International Flights..

(b) Disinsecting by Application of Residual Insecticide Film - In this method, a film of insecticide is sprayed on all internal aircraft surfaces (including cargo compartments, toilets, galleys) where insects may alight and so get killed. This method provides even deposit of 0.5 gm / sq.m on carpets and 0.2 gm / sq.m on other surfaces. 1 aerosol can containing 40 gm of 2% Permethrin (22:75) is sprayed in aircraft interiors 5-10 minutes before every flight. A more thorough procedure is carried out during night halts at weekly intervals wherein all storage areas are opened / cleaned and all window blinds are drawn. Doors / locker lids are sprayed on both sides. The ventilation system is switched off and all doors are closed after spraying. After 2 hours (recommended contact time), the air-conditioning is switched on for 2 hours in order to clear the air inside the aircraft.

2. Disinfestation - This is mainly used for the control of cockroaches. Aerosol spraying of the galleys, cabin, cockpit, cargo hold and toilet, is done at weekly intervals at night halts, using a suitable insecticide. The aircraft is then kept closed for 3-4 hrs. Spray Fumigation (with Pyrethrum 0.02%) is done at night halts by PCI on a monthly basis for control of flying Insects cockroaches. All carpet edges are lifted up and storage areas cleared. After 3-4 hrs contact time, the air-conditioning is switched on for 2 hrs to clear the air inside the aircraft.

3. Fumigation - Gas Fumigation is done for control of rodents. Methyl bromide is used at a dosage rate of 8 ozs / 1000 eft (8 g/m³) for 4 hrs. As

the gas is very toxic, this is done by qualified personnel only and correct protocol is stringently followed. All furnishing fabrics / seats are removed as they absorb the chemical. Gum Traps are used as a preventive measure.

Cleaning / Disinfection : Cleaning : This can be (1) Transit or Superficial Cleaning - This is done when the time available is short. Visible rubbish is removed, seats are brushed down, ashtrays / seat pockets are cleaned, carpet is swept, and toilets are restocked. The cleaning of galleys, cabin and toilets is done using non-damaging chemical disinfectants like QUAT (Quaternary ammonium compound). Disinfection includes all door handles, taps, locks and all furniture / fixtures with which passengers may come into contact.(2) Deep Cleaning - This is done when the aircraft is on ground more than 4 hours or during maintenance in the hangar with its component parts stripped off.

All procedures are carried out as per specified SOP, keeping hygiene, safety and efficacy aspects in mind. Cleaners are divided into 3 groups while cleaning aircraft, to prevent cross-contamination risks. One group is responsible for cleaning toilets / associated facilities; the second is responsible for the main cabin including drop-down tables, while the third is responsible for the galleys. Identification of different groups is facilitated by use of internal coding.

Disinfection

This is carried out when a passenger with some suspected infectious disease is inadvertently carried on board. A suitable disinfectant which does not harm the aircraft structure is used. Other sanitation protocols are strictly adhered to.

Air Transport of animals

This is done in accordance with the IATA Live Animals Regulations. Animals (dog's cats, day-old chicks) are carried in appropriate-sized, duly locked

cages, with ventilation holes. Contamination of the aircraft interior is prevented by placing plastic sheeting beneath the cage and extending it by 2-3" up the cage sides. It is ensured that ventilation holes remain patent. Animals are carried in Hold 1 which is pressurized and ventilated by the duct leaving the passenger cabin and then vented out of the aircraft. Temperatures are maintained between 26°-28° C. All animals have to be certified to be free of contagious diseases by a vet. Dogs are sedated prior to the flight. Only 1 cage (with 1 animal) is permitted per flight. Pest control / disinfection measures are followed as per standard protocol. Deodorants are used to minimize odors.

Special Points

Seat covers, curtains, carpets and cushions are made from special, permanently "Flame Retardant" fabrics conforming to specifications of FAR 25.853, which prevent fire spreading from its source. Should fire develop, it will extinguish itself. Any smoke emitted is non-toxic. This property of "Flame Retardancy" is built into the molecular structure of the basic polyester fibers - i.e. the fabric does not require any additional treatment and retains this property permanently despite wear and tear. These fabrics are also lightweight, and easy to clean.

Conclusion

All the practices described above are meticulously followed by Jet Airways. The next time you zoom across thousands of miles in a safe, clean, comfortable, well-appointed and well-maintained, aesthetically pleasing cabin, spare a thought for the thousands of behind-the-scene staff who are toiling round-the-clock to monitor and maintain the highest standards of excellence in Airline Hygiene, so that you can fly in a healthy, disease-free environment, and reach your destination on time, at all times