



Barrier Hygiene

INTRODUCTION

Barrier Hygiene is the prevention, by good process design and management, of end product contamination with micro organisms in numbers sufficient to cause food poisoning or premature spoilage.

At each stage of food preparation the manufacturer, caterer or retailer has a responsibility to the consumer to minimise the risks associated with the presence of pathogenic micro organisms. Thoughtful assessment of the risk factors involved is necessary when a food operation is being planned and designed in order to minimise risk. A HACCP exercise must be completed and the critical control points identified in the manufacturing process and distribution chain.

Risk factors and controls can be considered under four categories:

Raw material contamination

- **Many raw materials will be contaminated with various micro organisms. The nature and the degree of risk, which each type of organism imposes on the integrity of the finished product, must be determined. Some or all may be carried through or survive the process depending on methods taken to reduce their number.**
- **Laboratory evaluation of raw materials, coupled with the adoption of microbiological standards and limits, are critical if the process itself does not achieve a significant reduction in numbers.**

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Cross contamination

- **Because ingredients may be contaminated, the intake, storage and processing of raw ingredients must be kept separate from those steps in the manufacturing operation which occur after any process designed to reduce the number of micro organisms to an acceptable level.**
- **The building design should aim for a forward flow of ingredients through the manufacturing plant. Special care needs to be paid to the possibility of crossovers, e.g. the route from ingredient store to a processing room may be cross the path followed by the exposed finished product.**
- **Cross contamination may also occur as a result of the misuse of utensils or equipment. Where such a potential risk is identified, separate wash facilities for equipment used in the 'raw' and 'processed' parts of the process may be required.**
- **The planning of environmental controls is very important and often overlooked. Drainage flows may compromise the hygiene barrier by passing waste from 'raw' to 'processed' areas via surface gullies. Even the flow of sub floor drainage may need to be considered, especially if access is required within processing rooms to remove blockages.**
- **Aerial contamination may be a significant hazard. Steps may therefore be necessary to remove micro organisms from the airflow by filtration or to ensure that returned air is not picked up from 'raw' areas and transferred to processed food or high-risk areas. Air may need to be at a positive pressure in the high-risk area to ensure that air flows towards the 'raw' areas.**

- **Staff movements also need to be considered. Staff amenities such as toilets and changing rooms must be designed or even duplicated, with cross contamination risks in mind. It is not advisable for 'raw' and 'processed' area staff to share a canteen whilst wearing their protective clothing. Routes by which staff reach their work need to be planned and the movements of service staff such as cleaners and engineers should also be considered. Equally, attention must be given to the tools and equipment which they use.**

Contamination build-up

- **Poor equipment design may lead to an unacceptable build up of debris or by allowing untreated ingredients to accumulate to a level at which they may cross contaminate the processed food. Assessment of risk factors in equipment design will be most effective if microbiological monitoring is carried out during commissioning trials.**
- **Since contamination will build up anywhere in the process sooner or later, a carefully planned and properly managed cleaning schedule is essential. This will also be more effective if it is verified and subsequently monitored by laboratory assessment. Rapid methods should also be considered as this allows equipment to be checked prior to use in production.**
- **The principles established above should also be applied to services such as ventilation, compressed air, water and drainage.**

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People

- **The successful implementation and ongoing maintenance of barrier hygiene depends on the training and management of staff. Failure to achieve the required 'cultural' attitude may lead to hygiene practices which compromise the planned barrier hygiene.**
- **Planned training is essential and must start with induction training followed by more detailed food hygiene training. The level of food hygiene training will need to be at a higher level for supervisors and managers.**
- **The 'cultural message' is of particular importance where the layout is not ideal giving opportunities for cross contamination which need to be controlled by strict procedures. e.g in catering operations.**

SUMMARY

The adoption of good barrier hygiene is dependent on many factors. The use of food safety risk assessments such as HACCP techniques will help to identify potential areas of cross contamination and therefore aid barrier hygiene.