

5-Point Pathogen Control Model

- 1. Prevent pathogens getting into the high hygiene production area using barrier technologies.
- 2. Reduce pathogen harbourage sources in the manufacturing infrastructure (buildings and equipment) via good hygienic design.
- 3. Reduce cross-contamination vectors within the environment and to the product via Good Manufacturing Practice.
- 4. Effectively remove or kill the pathogen via validated cleaning and disinfection programmes.
- 5. Validating, monitoring and verifying controls identified to manage pathogens in 1-4 above.

Prevent Entry
Barriers to prevent pathogen entry should be established at every entrance/exit to the high hygiene area. For example, a validated barrier decontamination tunnel with controls around disinfectant concentration and contact time, nozzle orientation and operation, belt speed and stacking patterns of items to be decontaminated. Consider the movement of:-

- Product
- Packaging
- People
- Product containers/utensils/tools/items
- Air
- Waste.

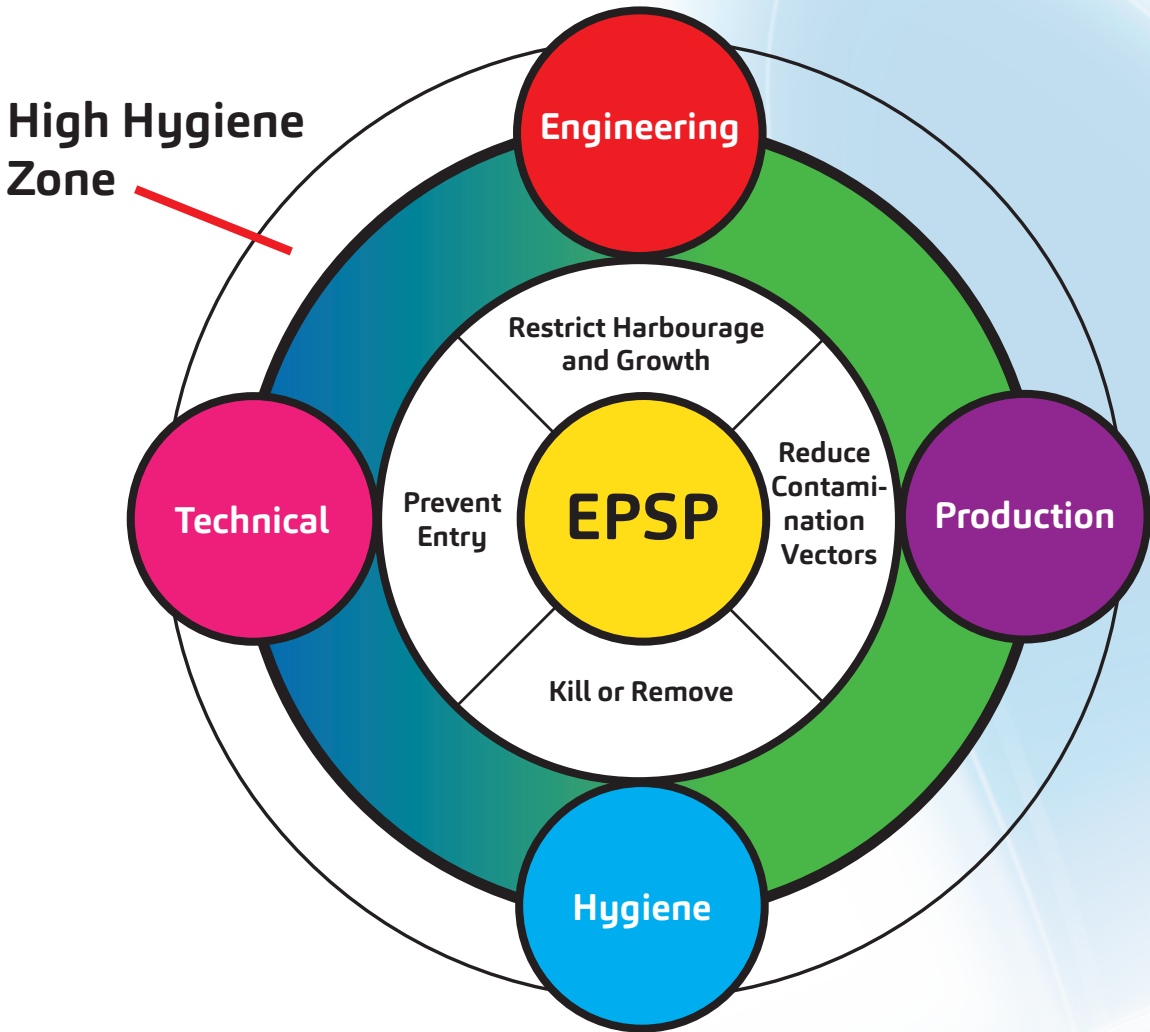
Barriers are developed and managed by **Technical**

Teamwork Is Key
A pathogen control team must be multidisciplinary, containing representatives of Technical, Engineering, Production, Quality and Hygiene.



- Restrict Harbourage and Growth**
Faults associated with the design or maintenance of the processing environment and equipment, which could harbour pathogens, should be controlled. This is particularly important if faults can harbour nutrients and water to allow pathogen growth. Such potential pathogen sources could include:
- Thermal movement joints, which expand and contract
 - Damaged floors, coving and building fabric
 - Poorly adhered or un-sealed structures to surfaces e.g. panels or chequer plating
 - Drainage systems
 - Areas subject to condensation build-up
 - Poorly designed processing equipment that cannot be effectively dismantled
 - Equipment framework which is not sealed
 - Equipment producing condensate e.g. evaporative condensers.

Sources are managed and controlled by **Engineering**



Kill or Remove
At a room level, cleaning and disinfection strategies and schedules should be designed to maximise the removal of any pathogens present from the processing environment and/or their decontamination in situ.

- The Hygiene Team is not the cause of pathogens
- The Hygiene Team is not the cure for pathogens
- The Hygiene Team can prevent pathogen escalation.

Pathogen removal and decontamination is managed by **Hygiene**

Reduce Contamination Vectors
Reduce and control the vectors that can transfer pathogens from sources directly to product or within the environment to secondary sources (which can then be transferred to product). Product vectors include: -

- Contact between the product and hard (equipment, utensils) or soft (hands, gloves) surfaces
- Contact between the product and the air or gasses
- Contact between the product and liquids.

Environmental vectors thus include: -

- Footwear
- Vehicle wheels (FLT, pallet trucks)
- Container wheels (totes, Dolavs, racks)
- Adverse air movements
- Aerosols.

Environmental vectors are controlled by **Production**

Environmental Pathogen Sampling Plans
Environmental Pathogen Sampling Plans (EPSP) verify barrier, source, vector and cleaning programme controls. Generic assessment of the presence of pathogens can be assessed by sampling 'collectors'. Collector samples maximise the detection of a pathogen by effectively sampling a composite of residues of the food product or objects that have been in contact with large surface areas including:-

- Food debris samples from equipment, e.g. built up around a slicer blade
- Cleaning equipment, wheels, footwear, drains.

A mature sample plan has a limited number of samples, in a balance such as:-

- | | |
|-------------------------------|--------|
| • Barriers | 20-30% |
| • Source and vector controls | 20-30% |
| • Collectors | 30-50% |
| • Post cleaning, disinfection | 5-10% |

The EPSP is managed by the **Pathogen Control Team**

If no pathogens are found in collector samples, and barrier, source, vector and cleaning controls are effective, there is a reasonable probability of no pathogens being present in the high hygiene environment