## Risk analysis

Risk analysis is defined for the purposes of the [Codex Alimentarius Commission](http://en.wikipedia.org/wiki/Codex_Alimentarius_Commission) as "A process consisting of three components: **risk management, risk assessment, and risk communication."**

A **food safety risk analysis** is essential not only to produce or manufacture the highest quality goods and products to ensure safety and protect public healthbut also to comply with international and national standards and market regulations. With risk analyses food systems can be straightened and [food-borne illnesses](http://en.wikipedia.org/wiki/Food-borne_illness) can be reduced. During a food safety risk analysis, all time and attention is directed to the major safety concerns in manufacturing premises. Not every safety issue requires a formal risk analysis. But sometimes, not even well-trained staff can handle some issues and therefore support of an independent consultant is necessary.

There is no such thing as

“ZERO RISK”

Therefore

Risk Analysis

is needed to determine

what the hazards are and to identify

their immediate, interim and

long-term effects on human health.

What is risk?

Risk is a function of the probability of an adverse health effect consequently to a hazard of food.



**Risk assessment**

Risk assessment is defined for the purposes of the Codex Alimentarius Commission as "A scientifically based process consisting of the following steps: (i) [hazard](http://en.wikipedia.org/wiki/Hazard_%28risk%29) identification, (ii) hazard characterization, (iii) exposure assessment, and (iv) risk characterization."

**Hazard identification** is "The identification of biological, chemical, and physical agents capable of causing adverse health effects and which may be present in a particular food or group of foods."

**Hazard characterization** is "The qualitative and/or quantitative evaluation of the nature of the adverse health effects associated with biological, chemical and physical agents which may be present in food. For chemical agents, a dose-response assessment should be performed. For biological or physical agents, a dose-response assessment should be performed if the data are obtainable."

**Exposure assessment** is "The qualitative and/or quantitative evaluation of the likely intake of biological, chemical, and physical agents via food as well as exposures from other sources if relevant."

**Risk characterization** is "The qualitative and/or quantitative estimation, including attendant uncertainties, of the probability of occurrence and severity of known or potential adverse health effects in a given population based on hazard identification, hazard characterization and exposure assessment." Hazard identification, hazard characterization, exposure assessment will help to know the adversed health effect.

**HACCP**

**Hazard analysis critical control point programme**

This is a systematic science based approach used in food production as a means to assure food safety.

HACCP is not just an end product testing & inspection, it is to prevent & a continous approach to food safety identifying/examining, analyzing / evaluating & establishing corrective measures & controlling hazards at every stage of food related operation. That is why it is effective & unique.

HACCP is a food related operation to:

* Identify & assess hazard at every stage of operation, right from start to finish.
* Determine the critical control point.
* Established the critical limits & procedures to monitor each critical control point &
* Establish corrective producers’.

Need for HACCP –

It is a systematic science based approach. HACCP offer a number of advantages –

 ---- Preventing food born diseases outbreak.

 Despite progress in food science & technology, food born diseases remain one of the most widespread public health problems in the contemporary world. As per WHO , up to 1/3 of population of developed countries are affected by the food borne illness each year.

* Food 7 water born diseases is one of the leading causes of illness & death in developing countries.
* One of the most important challenges is the increasing number of food born pathogen.
* To be careful of food contaminants & different types of hazardous item in food.
* Cross contamination & toxic effects.
* To increased consumer awareness of food safety.

Benefits of HACCP –

1. Benefit to consumers -
* Reduced the risk of food born diseases.
* Increased confidence in food supply.
* Increased awareness of basic hygiene
* Increased quality of life (health & socio economic)
1. Benefit to industry –
* Increased marketing access
* Reduction in production costs through reduced wastage.
* Increased consumer & government confidences.
1. Benefits of government –
* Important public health
* Enhanced international trade
* Confidence on food supply

Principle of HACCP (7 steps)

1. Conduct a hazard analysis –

 Team should start to process a flow diagram to find out the steps of finished products / hazard & measures. Identify hazards and assess the risks associated with them at each step in the commodity system. Describe possible control measures

1. Determined the CCP –

 When hazard which is measured are their then the team will established the points where control is critical to managing the safety of the product. A critical control point is a step at which control can be applied and is essential to prevent or eliminate a food safety hazard, or reduce it to an acceptable level.

1. Established critical limit’s -

 Preventive measures with critical limits to control the points. Each control measure associated with a CCP must have an associated critical limit which separates the acceptable from the unacceptable control parameter.

1. Established a system to monitor control of CCP-

 Team should specify monitoring requirements for management of the CCP within its critical limits, with question what / how / frequency / who. Monitoring is the scheduled measurement or observation at a CCP to assess whether the step is under control, i.e. within the critical limit(s) specified in Principle 3.

1. Established the corrective action to be taken when monitoring indicates that a particular CCP is not under control. Establish a procedure for corrective action, when monitoring at a CCP indicates a deviation from an established critical limit.
2. Establish procedure for verification to confirm that the HACCP system is working effectively. Establish procedures for verification to confirm the effectiveness of the HACCP plan.
3. Establish documentation concerning all produces & records appropriate. Such procedures include auditing of the HACCP plan to review deviations and product dispositions, and random sampling and checking to validate the whole plan.