

GMP / HACCP
Training Manual

Our Company

**is committed to the development and
implementation of GMPS following the
principles of HACCP.**

GMP Implementation and Management

Who's involved – everyone

Lead Hands are the key

What is a GMP/HACCP Program?

- **Good manufacturing programs/Hazard Analysis Critical Control Point**
 - *A system which identifies specific hazards and preventative measures for their control*

Programs to manage food safety.

- An internationally recognised program (Codex).
- A program designed to be specific to a food facility.
- A program that requires corporate commitment.
- A program that requires the commitment of each employee.

HACCP Program

- **A HACCP program has three components**
 - 1. GMP (Prerequisite Programs)**
 - 2. HACCP Plan**
 - 3. Verification Program**

GMP Program

**Our Company is focusing
on
GMPs at this time.**

GMPS vs CCPs

- GMPs (Prerequisite Programs)
control the environment that a food is produced in and the practices of the employees
- CCP (Critical Control Point)
a point or process (manufacturing control) in the operation which is designed to control a specific hazard.

- *Hope*

- *All*

- *Companies*

- *Control*

- *Products & Processes*



Origin of the HACCP Concept

- The concept of a HACCP Program was originally developed and implemented in the 1960's by the Pillsbury Company. 
- It was developed to ensure safe foods for NASA and the Apollo program by controlling the environment and the processing parameters.

What are the Benefits of GMPs & HACCP ?

- **A formalized safety management system based on good science.**
- **A higher level of understanding and participation of employees.**
- **Demonstrates due diligence and defines responsibilities.**
- **Builds client and consumer confidence.**



Benefits of GMP

- Consumer confidence — Regulatory Compliance
- Industry
 - Consistent quality and prevent re-work
 - Increased efficiency
 - Marketing tool



Grow business



Job security

What does GMP/HACCP do ?

- **GMP/HACCP provides an auditable system for food safety.**
- **GMP/HACCP requires a plan which dictates how a company manages food safety.**
- **GMP/HACCP requires companies to properly develop prerequisite programs (GMP) which detail how hazards may be controlled.**
- **GMP/HACCP requires critical control points to be established to control hazards not controlled by a prerequisite program.**



GMP/HACCP

and the Employee

- **GMP/HACCP will require the employee to understand the aspects of food safety in relationship to the tasks he or she performs.**
- **GMP/HACCP puts the responsibility of controlling hazards on the person performing the task.**
- **GMP/HACCP will prompt the employee to take corrective action before a deviation becomes a problem.**
- **GMP/HACCP requires employee commitment to perform their tasks as trained.**



Food Safety

- Food safety cannot be achieved by government regulations and inspection, it can only be achieved by careful handling of foods at all points in the food chain, from production to consumption.
- Food handlers must understand their role and accept the responsibility of their actions. It is the food handlers responsibility to provide safe, wholesome foods to the customer.
- It is also the food handlers responsibility to maintain the quality and reputation of their companies products and or services.



Food Protection

- **Proper controls are necessary to prevent contamination of food which may result in a potential health hazard.**
- **Control of critical points in the handling sequence of food is essential for the protection of food.**
- **Control can be achieved through corporate commitment and the planning and implementation of a sound, effective GMP/HACCP program.**

Characteristics of Food

- **Internal characteristics**
 - available nutrients
 - available water
 - pH (acidity or alkalinity)
 - physical structure
- **External characteristics**
 - temperature
 - atmosphere (presence or absence of O₂)
 - packaging

Temperature and Time

- Time and Temperature are the most important factors in the spoilage and safety of food.
- Temperature affects the rate at which microorganisms grow.
- Food handlers control temperature



HA - Hazard Analysis

- Hazard: *The potential to cause harm.*
- All food ingredients, food and processes are analyzed for three types of hazards:
 - Biological
 - Chemical
 - Physical
- Hazards may be
 - a cause
 - or a factor in food safety

Sources of Hazards

- **Workers**
- **Ingredients & Materials**
- **Equipment**
- **Processes**
- **Building**

Hazards from Source

- **Workers**
 - **Biological**
 - skin, nail, hair
 - colds, sores
 - clothing
 - **Chemical**
 - soaps, grease, chemicals
 - **Physical**
 - jewellery, clothing, pens



Hazards from Source

- **Ingredients & Materials**
 - **Biological**
 - **microorganisms associated with ingredients & materials**
 - **contamination**
 - **Chemical**
 - **allergens**
 - **chemical contaminants**
 - **Physical**
 - **foreign materials**

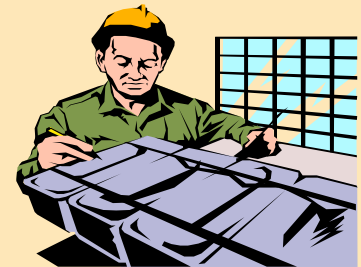
Hazards from Source

- Equipment
 - Biological
 - poor sanitation procedures
 - airflow
 - Chemical
 - lubricants
 - cleaning material
 - exhaust
 - Physical
 - metal filings
 - parts



Hazards from Source

- Processes
 - **Biological**
 - cross contamination
 - inadequate heat treatment
 - inadequate storage temperatures
 - **Chemical**
 - boiler chemicals in steam
 - chemical residues
 - **Physical**
 - foreign material



Hazards from Source

- Building
 - Biological
 - walls, floors, openings, storage
 - condensation, water
 - pests
 - employee flow
 - Chemical
 - storage of chemicals
 - ventilation
 - Physical
 - glass, metal, wood



CCP

Critical Control Point

- **CCP:** *A point, step or procedure at which control can be applied and a food safety hazard can be prevented, eliminated, or reduced to acceptable levels.*
- **Examples of a CCP**
 - freezer
 - fryer
 - metal detector
 - label
- **Critical Limit:** *A value which separates acceptability from unacceptability*



Biological Hazards

How do they become a problem in food ?

- **Contamination**

- from other foods
- people - hygiene
- pests
- equipment & utensils



- **Uncontrolled conditions**

- inadequate cleaning
- inappropriate facilities
- uncontrolled temperatures
- overcrowding of storage
- product exposed to moisture

- **Inadequate destruction**

- ineffective sanitation, programs and training
- inadequate heat treatment

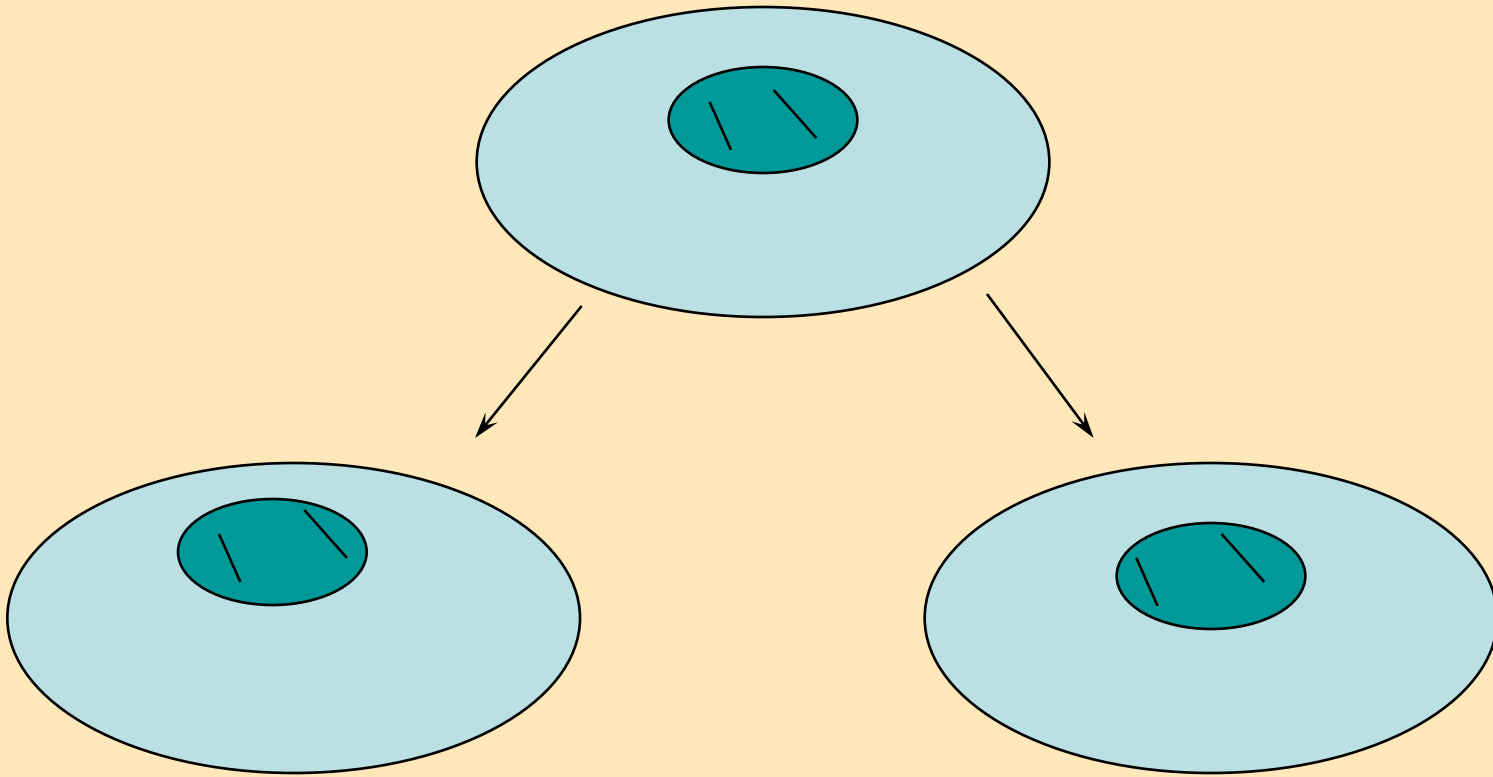
Controlling Biological Hazards

- **Temperature control**
 - Keep out of the Danger Zone
4°C - 60 °C.
 - Keep frozen food below -18 °C
- **Atmosphere control**
- **Nutrient control**
- **Moisture control**
- **Prerequisite programs (GMP)**

Microorganisms

- **Bacteria**
 - **Moulds**
- Grow in food**
- **Virus**
 - **Parasites**
- Do not grow in food**
- **Sources**
 - people, animals, insects, food, food surfaces, packaging, soil, water, air

How Bacteria Grow



Multiply by Dividing - every 20 minutes

Bacterial Growth

- If one bacteria was present on a food at 9 A.M. and was allowed to grow in optimal conditions with enough food at 10 A.M. there would be 8

Noon	512
4 P.M.	2 million
7 P.M.	1 billion
after 48 hrs.	2^{114}

- This mass would weigh 4000 X the weight of our planet.

Chemical Hazards

- **Cleaners & sanitisers residue**
- **Chemicals - lubricants & paint**
- **Natural toxins - aflatoxin**
- **Allergens - eggs, nuts, milk, peanuts**



Chemical Hazards

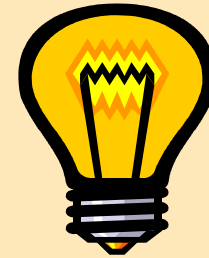
- **How do they become a problem in food ?**
- **Contamination**
 - from other foods
 - residues
 - equipment & utensils
- **Uncontrolled conditions**
 - inappropriate or lack of SOPs
 - inappropriate storage facilities
 - lack of specifications and QC
 - overcrowding of storage

Controlling Chemical Hazards

- Appropriate SOPs.
- Appropriate prerequisite programs.

Physical Hazards

- Injurious Extraneous Matter (IEM)
 - Risk is based on hardness, sharpness, size or shape.
- Examples of IEM
 -  metal
 -  glass
 -  stones
 -  jewellery
 -  wood
 -  plastic



Physical Hazards

- **How do they become a problem in food ?**
 - **Contamination**
 - misuse of packaging
 - broken glass
 - from ingredients
 - pallets
 - physically damaged product
 - line breakdowns
 - **Uncontrolled conditions**
 - inappropriate or lack of SOPs
 - inappropriate storage facilities
 - lack of specifications and QC

Controlling Physical Hazards

- **Magnets**
- **Metal detectors**
- **X-ray**
- **Appropriate SOPs.**
- **Appropriate prerequisite programs.**

Prerequisite Programs

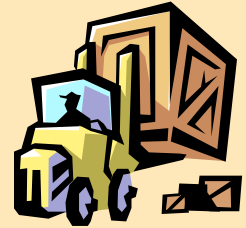
- Premises
- Receiving / Storage
- Equipment Performance & Maintenance
- Personnel Training Programs
- Sanitation
- Health and Safety Recalls

Premises

- **Outside property**
 - free of debris & refuse
 - proper roadways and drainage
- **Building**
 - permit cleaning
 - prevent entrance and harbourage of pests
 - prevent entrance of environmental contaminants
 - sound construction and good repair
- **Sanitary facilities**
 - washrooms, lunchrooms and change rooms
 - handwashing and sanitising facilities
 - equipment cleaning and sanitising facilities
- **Water quality and supply program**

Receiving / Storage

- **Receiving of raw materials, ingredients, food products and packaging**
 - Specifications & conformance
- **Storage**
 - Temperature and humidity controls
 - Of raw materials, ingredients, food products and packaging
 - Of finished food products
 - Of damaged and or returned goods
 - Of non-food chemicals



Receiving

- Food and packaging must be inspected on arrival.
- Reject product not meeting specification.
- **ALL FROZEN and REFRIGERATED FOODS MUST BE PUT INTO PROPER STORAGE IMMEDIATELY.**
- **STORE FOOD IN SUCH A MANNER AS TO AVOID CROSS-CONTAMINATION.**

Storage

- **Store all perishable foods below 4°C.**
- **Store all frozen food at or below - 18°C.**
- **Follow the FIFO (First In First Out) rule.**
- **Keep all food 15cm (6") off the floor & 46cm (18") between rows.**
- **Store products according instructions.**
- **Code all cases for easy ID, store accordingly.**

Equipment Performance & Maintenance

- **Equipment design**
- **Equipment installation**
- **Equipment maintenance**
- **Equipment calibration**
- **Preventative maintenance**

Personnel Training

- Manufacturing controls
- Hygienic Practices
 - Communicable disease
 - Injuries
 - Washing of hands
 - Personal cleanliness and conduct
 - Controlled access

Hygiene

- **The development and maintenance of conditions or practices conducive to good health.**



- **Generally regarded as personal cleanliness and habits.**

Handwashing

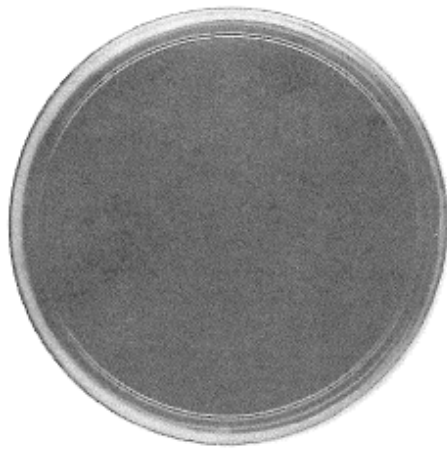
- Before starting work.
- After using the toilet.
- After touching your hair, ear, nose, mouth.
- After sneezing, coughing scratching.
- After eating smoking.
- After handling a food and before handling another.
- Before leaving or returning to your work station.
- After handling garbage and cleaning up.

Handwashing

- **To reduce or eliminate transient flora (Microorganisms)**
- **Hands, nails and exposed areas of arms for 30 seconds using soap and under running water.**

HANDS

Let's see how hand washing affects the number of bacteria present.



Bacteria grow on gelatin-like food (agar) in covered, sterile, plastic plates (petri dishes).



An unwashed hand that looks clean is touched to the agar.



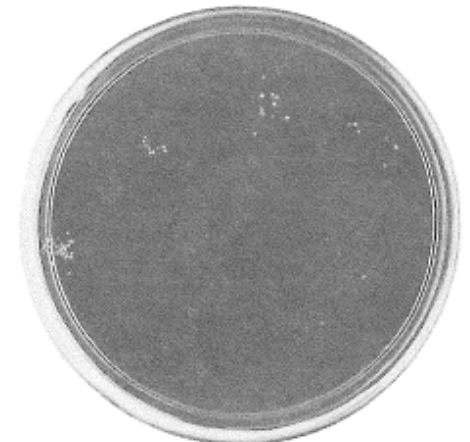
After washing hands for 15 seconds with hot water and soap, bacteria are reduced in number.



The bacteria grow rapidly by keeping them at a warm temperature (98.6°F). Twenty-four to 48 hours later, small colonies or clumps of bacteria approximately the size of a pinhead or larger can be seen in the agar.

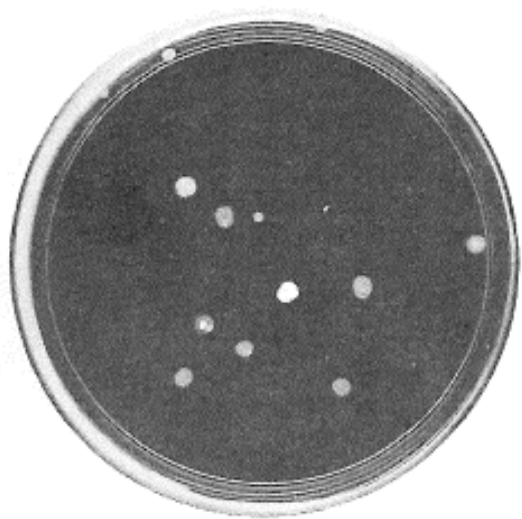


The plate is incubated at 98.6°F for 24 hours. The heavy growth of white colonies indicates that this hand was not very clean, and that millions of bacteria were present.

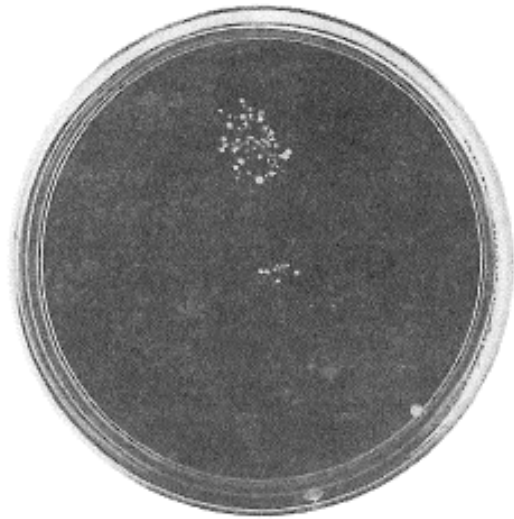


Washing the hands with soap and water for another 15 seconds reduces the bacteria even more.

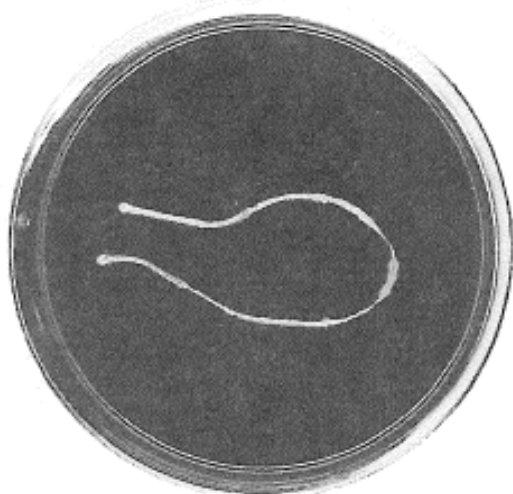
Figure 6-2 Bacteria on the body and the effects of hand washing. *Source:* Reprinted with permission from Cornell Cooperative Extension Publication, *Safe Food Preparation: It's in Your Hands*, © 1995, Cornell University.



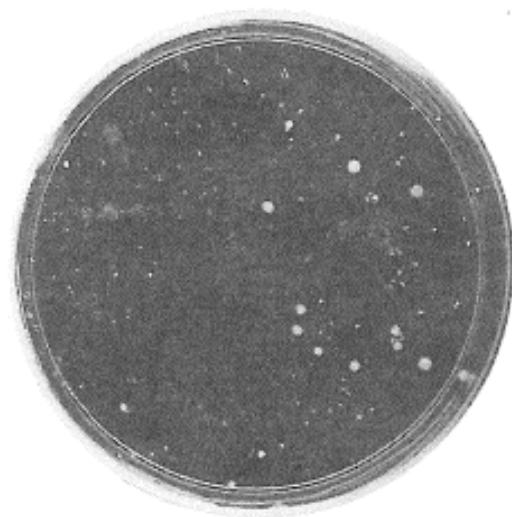
This picture shows the bacteria present in fingernail scrapings.



This plate shows what happens when the lips and nose are pressed against agar in a petri dish.



Hair is also a source of bacteria and has no place in food. It is unappetizing, unappealing, and adds bacteria to food. This picture shows the bacteria associated with human hair.



Each sneeze contains between 10,000 and 100,000 bacteria and they are moved through the air at more than 200 mph.

Hygiene

- **Use hair restraints.**
- **Garments, aprons and shoes must be cleaned and changed as necessary.**

Sanitation

- **Sanitation Program**
 - Adequacy
 - Adherence
- **Pest Control Program**
 - Adequacy
 - Adherence

Sanitation

- The development and maintenance of hygienic health supportive conditions.



- Generally regarded as the cleaning and disinfecting of food handling surfaces and facilities.

Sanitation Program

Areas that must be included in a cleaning program:

- food storage areas, equipment and work surfaces.
- toilet and hand washing facilities.
- lockers, dressing rooms, and lunchroom facilities.
- storage of clean and soiled linens, clothing and cleaning cloths.
- garbage and refuse disposal materials and areas.
- storage of cleaning compounds (poisonous and toxic materials).
- floors, walls and ceilings.
- ventilation.
- lighting.
- receiving area.
- entrance, parking lot.

Cleaning and Sanitising

- **Rinse surfaces with warm water.**
- **Wash and scrub as necessary using an approved cleaner as directed in the SSOP.**
- **Rinse surfaces with warm water.**
- **Sanitise using an approved sanitiser as directed in the SSOP.**
- **Time and temperature are critical in cleaning and sanitation.**

Pest Control

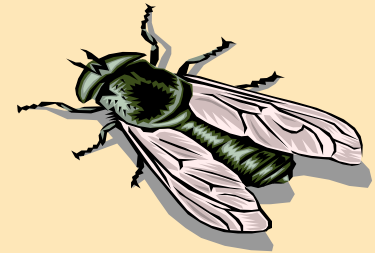
- **Eliminate entry ways.**
- **Eliminate habitats and food supplies.**
- **Destroy or catch those that gain entry.**
- **Regular inspections**
- **Sound well documented pest control program**



Pest Control

Remember

- 1 fly leads to 900
- 1 cockroach leads to 30 - 40
- 1 moth leads to 400
- 1 beetle leads to 375
- 1 rodent leads to 30



Pesticides and rodenticides can only be applied by certified technicians.

Recall

- Recall System
- Recall Initiation

Line Responsibilities in GMP/HACCP

- **Follow and understand the SOPs for your tasks.**
- **Understand your responsibilities and role in controlling a GMP/CCP in your area.**
- **Monitor CCPs and Prerequisites.**
- **Take prescribed or approved corrective action when needed to maintain control.**
- **Document corrective action**
- **Verify GMP/HACCP program is working correctly and document**

An Ineffective GMP/HACCP Program

- **Results in improper handling of foods:**
 - **Consumer illness or dissatisfaction**
 - **Consumer emotional trauma**
 - **Customer dissatisfaction**
 - **unfavourable publicity**
 - **increased customer & consumer complaints**
 - **loss of volume and profits**
 - **liability claims, lawsuits and criminal**
 - **prosecution (legal and court costs)**
 - **high insurance costs**
 - **food spoilage -product loss - dollar loss**
 - **unsanitary conditions**

An Ineffective GMP/HACCP Program

- **Which may lead to:**
 - **loss of customers & markets**
 - **negative employee attitudes**
 - **absenteeism**
 - **retraining**
 - **even layoffs**

Documentation

- **An extremely important part of GMP is documentation of every aspect of the process, activities, and operations involved**

Documentation

- **Why is documentation and record keeping important:**
 - To be clear about what you do and how you do it
 - To confirm that you have done it correctly
 - To show proof of process – due diligence
 - To identify non compliances and deviations
 - To assist in planning corrective action

Benefits of Good Documentation

- **Provide basis for training and qualification of staff**
- **Provides for consistent operation**
- **Provides a starting point for process improvement**
- **Provides a “Paper Trail” – A starting point for problem resolution**

Remember

- **Do as you say,**
- **Say as you do !**
- **Do it !**





- *Hard*
- *Agonising*
- *Confused*
- *Complicated*
- *Paperwork*

GMP/HACCP Test

- 1) GMP/HACCP is
 - a) a way of testing food.
 - b) a system to manage food safety.
 - c) developed by Health Canada.
 - d) all of the above.
- 2) A critical control point is
 - a) an acceptable level of risk.
 - b) where control can be applied to prevent or reduce a safety hazard.
 - c) where loss of control may result in an unacceptable food risk.
 - d) both b and c.
- 3) Which are potentials for hazards
 - a) no process to control microorganisms or chemicals.
 - b) ingredients are a possible source for microorganisms.
 - c) abuse in distribution and storage.
 - d) all of the above.
- 4) What is the key to a successful GMP/HACCP program?
 - a) hazards.
 - b) temperature control.
 - c) corporate commitment.
 - d) product testing.
- 5) GMP/HACCP is
 - a) the responsibility of all employees.
 - b) will require the commitment of all employees.
 - c) will prompt the employee to take corrective action.
 - d) all of the above.
- 6) The line employee will be responsible for
 - a) controlling CCPs.
 - b) monitoring CCPs.
 - c) take corrective action when needed to maintain control.
 - d) all of the above.
- 7) Hazards are generally
 - a) chemical.
 - b) biological.
 - c) physical.
 - d) all of the above.
- 8) Physical hazards may include
 - a) stones.
 - b) wood.
 - c) glass.
 - d) all of the above.
- 9) Chemical hazards may include
 - a) pesticides.
 - b) cleaning and sanitizing compounds.
 - c) allergens.
 - d) all of the above.
- 10) Benefits of a GMP/HACCP program include?
 - a) a formalized food safety system based on good science.
 - b) higher levels of understanding and participation of employees.
 - c) demonstrates due diligence.
 - d) all of the above.