

'whole milk' quality assurance and control department proposal for gmp certificat...

[Nutrition](#), [Food Safety](#)



Introduction to Food Safety

Food safety has become a common concern all around the world, leading governments and healthcare institutions to find ways to monitor the food production chains. Food safety refers to handling, preparation and storage of food in ways that avoid food-borne illness. Food-borne illness is described as the occurrence of two or more cases of a similar illness that came from the ingestion of a common food (Texas Department of State Health Services, 2015).

Food hazards occurs when food is contaminated with other substance. The hazards can be biological, chemical and physical. Biological hazard happens when the food has been contaminated by living things such as humans, animals and microorganisms. This includes bacterial contamination, parasite contamination and viral contamination that transferred through several ways. Bacterial contamination is the most common cause of food poisoning worldwide. One of the common bacteria contaminations in year of 2018 is the outbreak bacteria strain E. coli in romaine lettuce, that resulting five people died and more than 300 people sick. (Jacobs, 2018)

Chemical hazard refers to food that has been contaminated with a natural or artificial chemical substance such as herbicides, pesticides, sanitizers, veterinary drugs, polluted environmental sources and etc. Chemicals that caused the contamination normally they are not intentionally added by the manufacturer. Moreover, Physical hazard refers to food has been contaminated with foreign object such as hair, fingernails, metal, plastic, glass and etc.

Throughout history, milk and milk products were the favorite food for the young and old around the world. In fact, milk contains nine essential nutrients, thus it is one of the most nutritious beverage in the market. But in term of food safety, milk poses many challenges. Milk is an excellent growth medium for a variety of both pathogenic and non-pathogenic microorganisms. Its proteins cause it to be listed among the “ Big Eight” foods that account for 90% of all food-allergy reactions in the United States. The carbohydrate in milk, lactose, cannot be physically tolerated by millions worldwide, resulting in stomach cramps, bloating and other gastrointestinal symptoms. (Thomas, 2009)

According to Centers for Disease Control and Prevention (CDC), from 2007 through 2012, 26 states reported 81 outbreaks linked to raw milk. The outbreaks caused 979 illnesses and 73 hospitalizations in the United States. (CDC, 2017) Not only for raw milk, there was also a large outbreak linked to pasteurized milk. In 2016, outbreak of Campylobacteriosis in pasteurized milk involved over 1, 644 illnesses among inmates that was produced by an on-site prison dairy (John, 2009) The two general causes of contamination of pasteurized milk are equipment failure and post-pasteurization contamination. Hence, strict adherence to prescribed procedures such as GMP, HACCP and SSOPs is critical to overcome the food safety challenges.

Introduction to Good Manufacturing Practices Program (GMP)

1. Brief Introduction of Good manufacturing practices (GMP)

In the modern generation, the studies in foodborne spoilages, food illness, food contaminations and their related issue are vital in order to prevent the

outbreak of foodborne diseases. The main treat of the spread of illness can be due to the poor hygiene throughout the processing and preparation line of food product by any food establishment. At worst, it will impose life-threatening risks to the consumers and public for consumed the contaminated food. The happening of foodborne outbreaks can damage the nation image as well as causing the decline in foreign visits, loss of citizen earning, unemployment and eventually lead to the collapse of trade and tourism in long term (MS, 2009). After all, Malaysia offer a great variety of foods from different ethnics and cultures which give satisfaction to anyone who experience it (Abdul Karim. A. F, 2016). Protection on the national uniqueness and citizen health safety are important. Effective hygiene control can be key role to prevent adverse human health and economy due to food spoilage, foodborne illness and diseases.

Good manufacturing practices (GMP) is a part of quality assurance that consist of basic control measures, procedure, regulations, codes and guidelines that govern the operating condition to produce quality product which are safe for human consumption (MS, 2013). It is an essential yet basic implementation for food safety recognition for global that must be certified by authority department. GMP guidelines provide the minimum requirements or demand for a food product manufacturer must meet to ensure a consistent safe food production that manufactured under a hygienic manner by practicing the best manufacturing practices. The requirements for food hygiene according to GMP to ensure the safety of foodstuffs during preparation, processing, manufacturing, packaging, storage, transportation,

distribution, handling or offering for sale or supply in any sector of the food chain.

Not to mention that GMP is also one of the pre-requisite programmes (PRP) for the establishment of the Hazard Analysis Critical Control Points (HACCP) System. A HACCP System, on the other hand is a system which identifies, evaluates and controls hazards which are significant for food safety. Aside from both of these systems, standard operating procedure (SOP), sanitation standard operating procedure (SSOP) and adequate training are the major parts of the food safety plan within a food establishment. GMP and SSOP are the basic programmes before implementation of HACCP.

GMP guideline will be varies based on the countries' standard or legislation. In Malaysia, the Department of Standards Malaysia (STANDARDS MALAYSIA) is the national standardisation and accreditation body which job scope include giving authorities to standardise the GMP guideline for the food and give accreditation for food establishment. MS 1514: Good Manufacturing Practice (GMP) are adoption of international standards that under governed of Standards of Malaysia Act 1996 (Act 549) in Malaysia. Back in times, GMPs started as regulations issued by authority of the Federal Food, Drug, and Cosmetic Act (FDA) due to the FDA legislation and consumer protection issues. Many tragedies and outbreak due to lack of monitoring and standard for manufacturer which even causes death, drive the improvement of law and regulation and eventually evolved to the current GMP. Malaysian Standards will be periodically reviewed. The MS 1514 GMP for food was first reviewed in 2009 together with the Malaysian Food Hygiene Regulations

2009 and Food Regulations 1985. Specific food production will have different or detail code for the hygienic practice. Examples for milk production will refer to CAC/RCP 57-2004, Code of Hygienic Practice for Milk and Milk Products.

All the employee should be trained to practice GMP procedure. The GMP standard follows the food chain from incoming materials through to the customers, highlighting the key hygiene controls at each stage. The requirements for food hygiene according to GMP to ensure the safety of foodstuffs are during preparation, processing, manufacturing, packaging, storage, transportation, distribution, handling or offering for sale or supply in any sector of the food chain. The base-line structure on GMP should be applied effectively in the whole chain of food establishment. The component in GMP are the design and facilities; control of operation; maintenance, cleaning and sanitisation; personal hygiene; transportation and distribution; product information; training; internal inspection; management review; and legal requirements.

2. Function of GMP

As consumer or customer, the spoilage condition of food product that we bought cannot be easily detect by human senses unless severe spoilage symptoms occurred in the appearance and smell (such as growth of mold and give off faulty odors) to indicate the food product is unsafe to be eaten. So the incorporation of GMP by food establishment play important role for the customer as a sign in food safety. Customer will be more confidence in purchasing the food product with GMP logo as the requirements are to

produce safe food products to quality standard which suitable for human consumption under a govern condition and practices from the beginning of processing until distribution to food premise shelf. Consumer should understand the role of MS - GMP recognition for a better selection of safe food product.

Referring to the GMP guideline can provide sufficient guidance for many aspect in any sectors of the food chain; processes; or commodities. The guidance help in amplification of the hygiene requirements specific to different areas (wet and dry area). Not only that, implementation of GMP guideline in a food establishment can outline the essential principle of food hygiene application and ease their manufacturing system to have high quality food production that is safe for human consumption. The minimum requirement of GMP and steps to comply those principle were outlined, thus food establishment can do comparison and acknowledge their own weakness and do better improvement to the current system. Giving a more clear-cut on how to provide food which is safe and suitable for consumption through the necessary of maintain a hygienic environment within the food establishment. The main goal of implementing GMP are to safeguard the health of consumer and producing quality food product.

Moreover, food establishment that followed GMP enable the consumers to understand the information more easily in the way of labelling the food products' details. Production, handling, preparing and storing of food product in a correct way based on GMP can protect the food from contaminant as well as the cross contamination of foodborne pathogen. Eventually, the good

practices can improve the reputation of the company thus able maintain the confidence of local customer and even internationally traded food.

Successful GMP certification must be maintain to apply for the next level of safety plan; HACCP. As stated GMP is the pre-requisite programmes that provide foundation toward the preparation to achieve or implementing Hazard Analysis and Critical Control Point (HACCP) certification. For sure more strict requirements need to be fulfilled.

In short obtaining GMP certification or recognition will increase consumer confidence in purchasing the food products manufactured; ensure the consumption of that food product are safe for human; consistent quality product production; provide guidance for improvement to the current system in term of hygienic environment; give clear guideline on how to implement the GMP steps; easier understanding of the product through labelling; protect from contamination that can causes foodborne outbreaks (cross contamination from microorganism, chemical and physical contamination); increase confidence in international trade food; assist in expanding the product market internationally; increases operational efficiency due to process streamlining and reduction in non-compliant activities; formulates foundation for HACCP certification and other safety standards; enhance the image of company as a safe food production manufacturer; and to comply with current legislation and standards.

3. Brief Details of Elements in GMP

In Malaysia, MOH will enforce GMP regulation by doing regular audit to the food manufacturer's facilities. The main purpose is to monitor and check the

food manufacturer facilities so they are in good condition, the equipment are well maintained and calibrated, sufficient and proper training given to the employees and the efficiency of the processing line are reliable, hygienic environment and safe food production. Here are the components in GMP guideline for the manufacturer practice.

Component Details

Design and facilities Depending on the nature of the food business and the possible hazard related to the production: (few objectives)

1. Facilities and equipment must be properly design, located and constructed to ensure the minimum probably of contamination.
2. Layout of the manufacturing must allow minimum air-borne contamination, proper maintenance, effective and efficient cleaning and disinfection.
3. Strong and effective was of pest control and harbourage.
4. Physical facilities must be designed to minimize the growth of microorganism or at least easy for sanitation.

Rationale design on the food establishment construction as well as the layout for smooth and efficient processing line must be take into consideration. Location of food establishment must be consider to be away from the environmentally polluted areas, area prone to pest infestation and etc. Not only that, the internal design for the food establishment must prior to smooth production and safety.

Control of operation Control each and every procedure so that production of food that is safe for human consumption are achievable. Designing, implementing, monitoring and reviewing effective control system are important to be done as a part of quality control and quality assurance. Control system may include in the aspect of food hazard, time and temperature control, microbiological and other specifications, control of specific process steps, control of microbiological cross-contamination, control of physical and chemical contamination, control of non-conforming products, incoming material requirements, packaging, water in contact with food, documentation and records and management and supervision. Management and supervision on the workflow are important to take action in every unexpected occurrence.

Maintenance, cleaning and sanitisation Large workload should be done to ensure the cleaning process, sanitisation and the maintenance of facilities and equipment. Great threat will put on the company and danger the consumers' health if the facilities and equipment contaminated the food product. Every step was essential and need to be monitor properly. Control of pests and manage waste also part of the maintenance, cleaning and sanitisation as it facilitates to have effective control of food safety hazards, pests and other agents that likely to contaminate food. Documentation and record on the maintenance program for the ease of tracking the history. Moreover, each and every part in the food establishment may have the growth of biological contaminant as we cannot see through naked eye. The most effective way to prevent are practicing the effective and proper

cleaning, sanitisation and the maintenance. This involve in the equipment and utensils, building, fixtures and other physical facilities of the premise, any structural alteration, repairs, renovations, plumbing, or drainage work, the floor plan, food-contact surfaces. Pest control systems must be well established as pest give a great treat to the safety and suitability of food. Good hygiene practices should be employed to avoid creating an environment conducive to pests. Lastly, proper organization of waste management such as the procedure to handle liquid waste and solid waste.

Personal hygiene Good personal hygiene in all employee must be ensure especially those in food production line which have the highest possibilities in contaminating the food they handle. High degree of personal cleanliness and operating method must be performed very well as most outbreak of foodborne illness are caused by the cross contamination from food handler to the food product. Rule and regulation in each food establishment facilities must be obey. For instance, washing hand before and after food preparation, wear appropriate wear clothes all the time, and so on. Company should provide and ensure regular medical check-up for the employee taken to prevent the transmission of diseases. All the personal hygiene can be control if the employees have high personal cleanliness, no illness and injuries and good personal behaviour (examples: no licking fingers, splitting, etc).

Transportation and distribution GMP on transportation and distribution mainly to prevent the contamination of food and damage on food product during transportation. These damage and contamination occurred will cause the food unsafe for food consumption. Controlled environment (temperature,

humidity, atmosphere and other conditions) should be met for respective food type in order to minimize the risk of pathogenic growth and toxin production in food. Type of conveyances or containers used must be put into consideration with packaging. Effective cleaning, proper packaging, disinfection (if necessary), separation of the conveyances uses between non-food and food item should be noted during each process of transporting from each location to another location.

Product information

Proper labelling in the way that product information can be message to the consumer easily. Sufficient and accessible information or instruction available for the next person to handle the food product safely and correctly. Put it simple was to prevent mishandling of the food that may cause illness and unsafe for human consumption. At worst, recalled of the products by batches can be easily identified when needed.

Training

Training programmes held for all the employee of food operation either directly contact or indirectly contact with the food. It is because it the fundamental in implementation of GMP. Training given will cultivate their awareness and responsibilities to maintain hygienic environment and personal hygiene for the operation of safe food production. Those who handle strong cleaning chemicals or other potentially hazardous chemicals shall be instructed in safe handling techniques as well. Internal inspection Forming internal inspection department to monitor and surveillance the manufacturing process from time to time, in order to achieve the objectives

of GMP and company nature. Self-inspection and internal audit importance to work out the adequacy and effectiveness of safe food production. Periodically internal audit will be conducted.

Management review

Company's management with executive authority must review on the suitability, effectivity of GMP to be continue in future. Other method and requirements to be meet in order to satisfy the GMP certification. Legal requirements Legislation and relevant condition must be fulfilled and updated for a better system operation from time to time.

All details taken from MS – Department of Standards Malaysia. 2009. Good Manufacturing Practice (GMP) for food – First Revision.

4. Details in applications of GMP

After knowing the benefits of GMP, application of GMP certification for company manufacturing are inevitable. Information on application procedure for GMP certification can be obtained from the official site of Ministry of Health (MOH). In order to be accredited for GMP, all the step and GMP component or element in Malaysian Standard MS1514 Good Manufacturing Practice (GMP) must be implemented effectively. Certification only will be given when food establishment successfully adopted and maintained GMP systems.