UMP OPEN COURSEWARE

Universiti Malaysia PAHANG
Engineering • Technology • Creativity

Chapter 4:

Food Safety

Expected outcome:

a) Able to categorize various sources of safety threats in food processing and production
b) Able to discuss safety standard in food industry

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Content

- Introduction
- Microbiological safety
- Chemical safety
- Physical safety
- HACCP

Introduction

- Vast subject area → multidisciplinary in nature
- From seed/livestock genotype → primary agriculture, primary, secondary, and tertiary processing, formulation, packaging, distribution, retailing, domestic storage and finally consumption
- Not necessary about real risk to public health, but also about perceived risk.

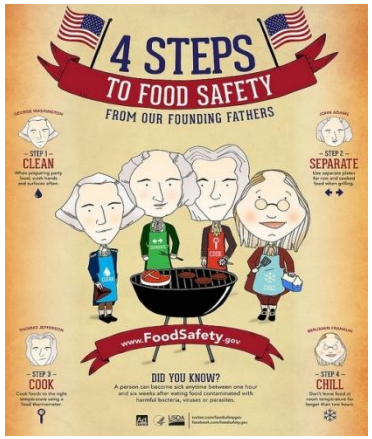

Photo credit: U.S. Department of Agricultu; flickr; CC BY 2.0

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Microbiological safety

- Toxic metabolites → growth of microorganisms in food before ingestion → food-borne intoxication
- Ingestion of living microorganisms → food-borne ingestion

Photo credit: Adamakafade; Wikimedia; CC BY 3.0

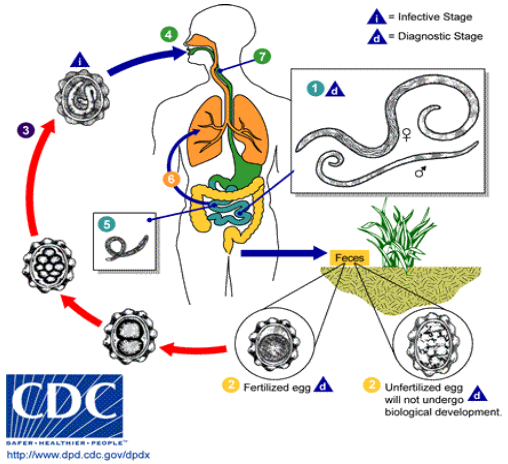

Photo credit: The cat ; Wikimedia; PD

Microbiological safety

- Main source – on farm, during food processing, food service preparation, or preparation at home
- Changing consumer life styles – increase the number of women in the workforce, limited time for food preparation

Photo credit: Chris 73; Wikipedia; CC BY 3.0

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Chemical safety

- **Perception of risk** – Effects of chemical contamination are less evident, one-off exposure will cause a disease long after exposure (e.g carcinogen) / chronic exposure will produce slow irreversible degeneration (e.g lead, mercury), ➔ permanently impairing, or fatal.

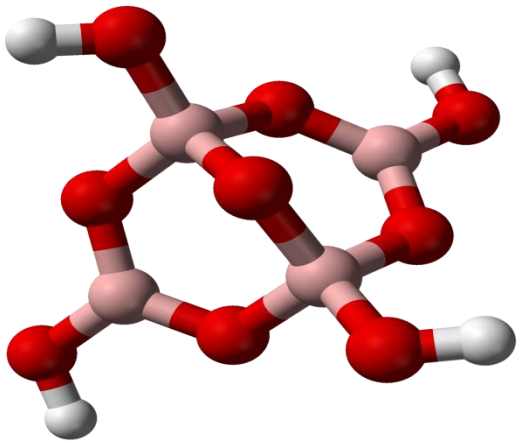

Photo credit: Ben Mills ; wikimedia; PD

Chemical safety

- Veterinary residues – hormones or antibiotics.
- Hormones in livestocks → human development and population
- Environmental contaminants
- Packaging material
- Naturally occurring toxicants

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Physical safety

- Foreign bodies – safety risk (a piece of glass in baby food, a needle in soft drink can), perceived degradation of quality (a piece of wood in a fruit pie, an insect in a prepared salad)
- Challenge – more sensitive methods of checking ingredients in food from contaminants.

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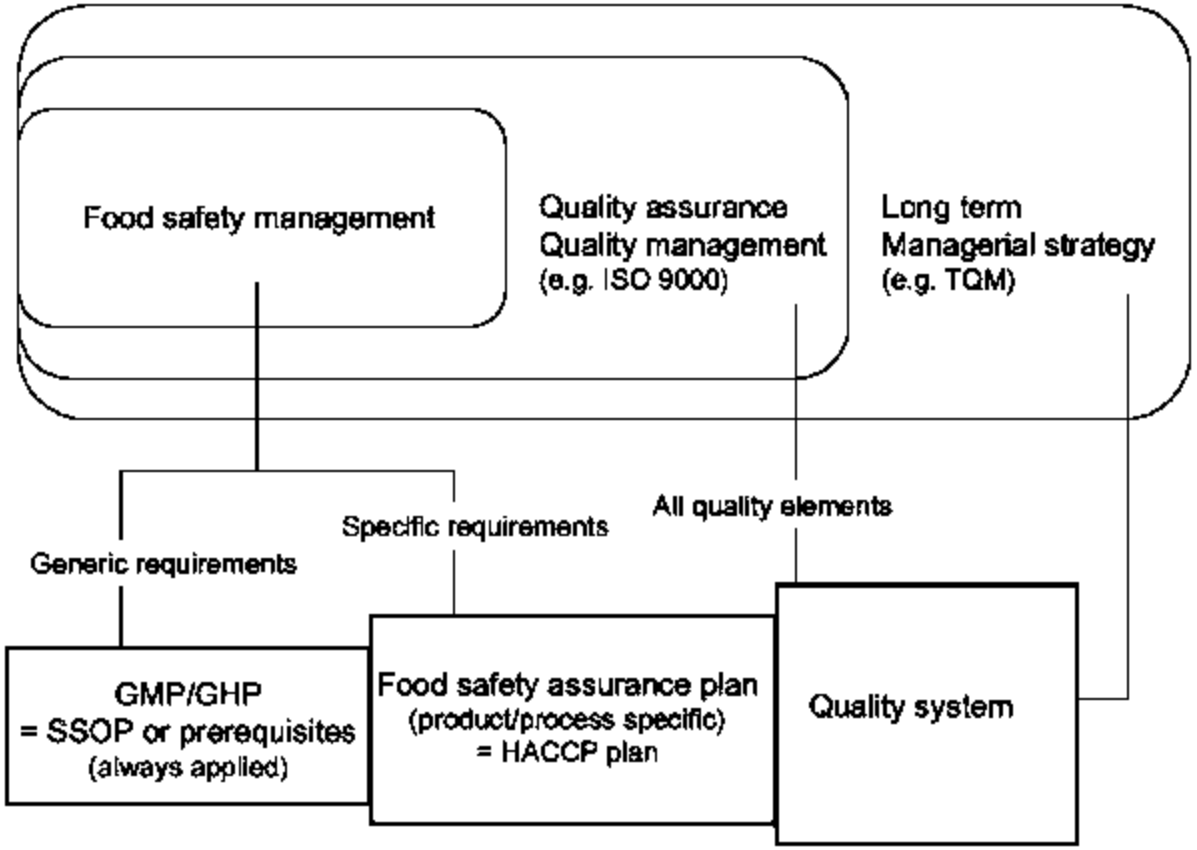
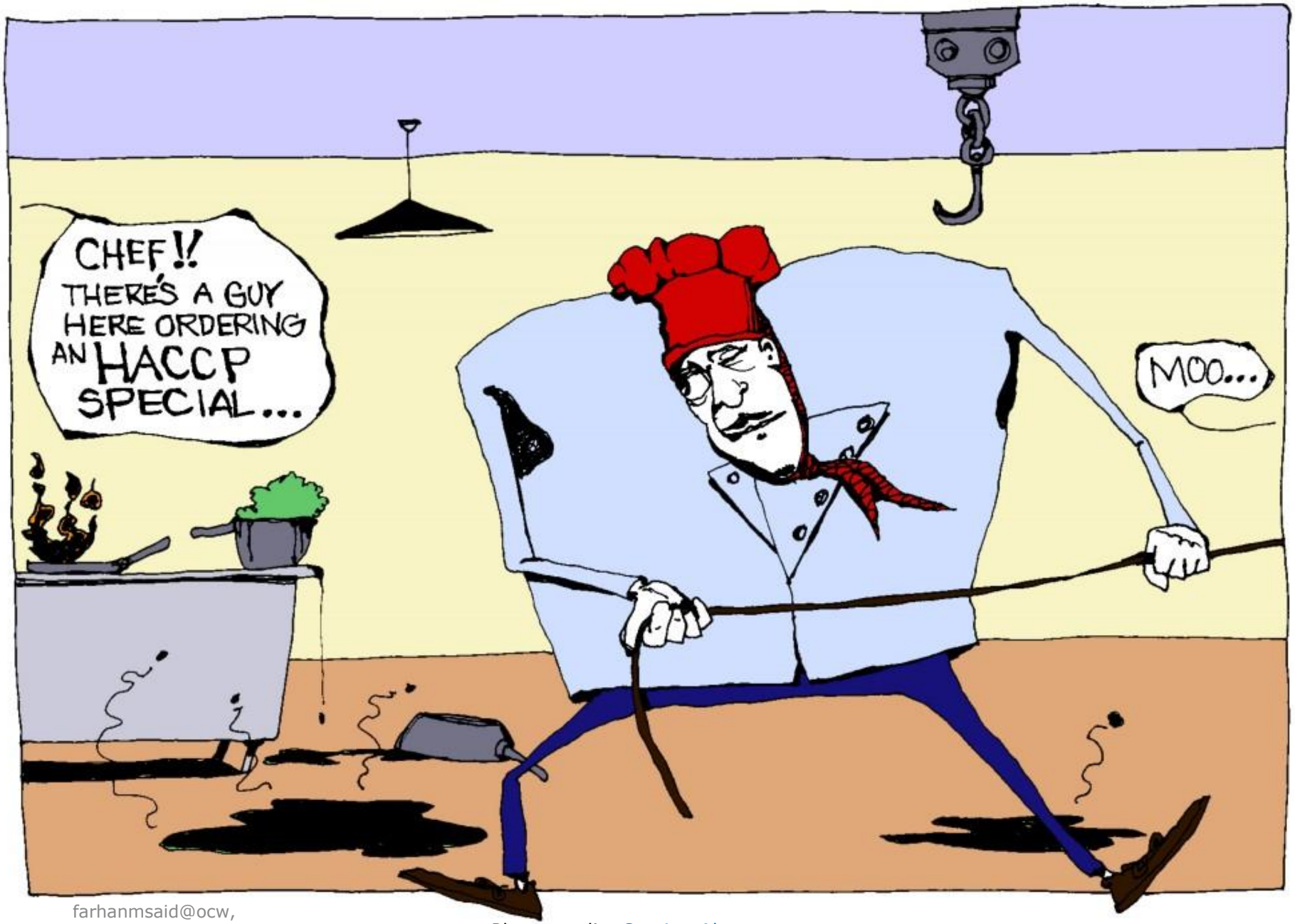
Relationship between GHP,GMP, HACCP and TQM



Food safety tools: an integrated approach (modified and adapted from Jouve *et al.*, 1998)



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Hazard analysis and critical control points (HACCP)

- A quality assurance system widely used in the food industry to help prevent both food safety and product quality problems
- 7 principles
  - Conduct a hazard analysis
  - Determine the critical control points (CCPs)
  - Establish critical limits
  - Establish a system to monitor control of CCPs
  - Establish the corrective actions to be undertaken when monitoring indicates that a particular CCP is not under control
  - Establish procedures for verification to confirm that HACCP is working effectively
  - Establish documentation concerning all procedures and records appropriate to these principles and their application