IUFoST Distance Education

Model Answers
(Given in Red Font alongside / below each question)

Food Hygiene and Basic Food Microbiology (Module 4)
Assignment 2014

Note to Instructor: This Model Answer document contains typical answers to the questions. However, marks may be awarded to answers that are not included in this document, provided that they are factually correct and are relevant to the question.

1. Observe any food preparation of your choice that includes a heating process (this may be at home or a local street vendor for example), from use and handling of raw food to cooked food and final serving of the food to the family or consumer.
   a. List at least five examples you can see of bad hygiene practices (5 marks).
      Any 5 examples for 1 mark each (5 marks) of bad hygiene practices are acceptable, for example, not wearing clean protective clothing; not washing hands with water and soap after visiting the toilet; handling money and then working with ready-to-eat food and not washing hands in between; using utensils on raw food and on cooked food without washing them in between; pests running around or flies and other insects landing on food; coughing / sneezing over the food; not keeping food either cold (<5 deg C) or hot before serving and after cooking (>60 deg C); eating or smoking and then handling food without washing hands; blowing nose and not washing hands before handling food; not washing dishes, cutlery etc with soap and clean water; not storing these in clean areas etc.
   b. Supply alternative good hygiene practices that should rather have been used (5 marks).
      Any correct description of the 5 examples mentioned in (a) for 1 mark each = 5 marks

2. Observe any food preparation of your choice if you are not employed in the food industry or a food processing operation if you do work in the food industry. List at least two potential contaminants for each of the following groups that could enter or be present in the product at any stage and give two possible sources for each of these contaminants:
   a. Biological contamination (6 marks)
      Any 2 of the following (1 mark each = 2 marks): Pathogenic bacteria, parasites, viruses, toxin-producing moulds
      Possible sources (any 2 sources associated with each of the 2 examples selected above for 2 marks each = 4 marks)
      Pathogenic bacteria, parasites, viruses – contaminated raw materials, bad hygiene practices (transfer of pathogens from nose, hands, mouth etc – particularly relevant to pathogenic bacteria), infected food handlers / carriers, pests if not controlled, dirty environment, bad quality water etc.
      Toxin-producing moulds – contaminated raw materials, bad storage practices.
   b. Chemical contamination (6 marks)
      Any 2 of the following (1 mark each = 2 marks): Pesticide residues at levels exceeding legal limits, veterinary drug residues at levels exceeding legal limits, presence of illegal / banned pesticides and veterinary drugs, sanitizer residues, oils
and lubricants etc;
Possible sources (any 2 sources associated with each of the 2 examples selected above for 2 marks each = 4 marks)
Pesticide and veterinary drug residues – excessive application of these chemicals, not keeping to withholding periods, using banned / illegal substances, not rinsing equipment adequately after using sanitizers, not maintaining equipment appropriately (hence the need to use food grade oil).

c. Physical contamination (6 marks)
Any 2 of the following (1 mark each = 2 marks): stones, glass / crockery, metal, hard plastic etc.
Possible sources (any 2 sources associated with each of the 2 examples selected above for 2 marks each = 4 marks)
Stones – environment, raw materials etc
Glass / crockery – splinters / pieces from bottles used as packaging material, sight glass from equipment, broken windows not laminated, shards from lights hanging overhead of not covered; eating from crockery plates / drinking from crockery cups close to food being produced / cooked where piece breaks off and lands in food;
Hard plastic – Bringing hard plastic items into food preparation or producing area e.g. soft drink containers; equipment or utensils (relevant to kitchens / street food vending) or any other items made from hard plastic
Metal – equipment, knife blades etc.

3. Practicing personal hygiene is vital to prevent transfer of foodborne pathogens from humans to food. Conduct some research and list any four microbiological contaminants by name that could be transferred to food from humans due to bad personal hygiene. Also, state what bad practice you think could have led to the transfer of each contaminant listed (example, the parasite Cryptosporidium: not washing hands after visiting the toilet) (8 marks).
*Escherichia coli* – going to toilet and not washing hands thereafter
*Salmonella* – ditto
*Hepatitis A* – ditto
*Norovirus* – ditto; also touching mouth/nose and not washing hands before handling food
*Staphylococcus aureus* – blowing one’s nose and not washing hands thereafter
Any other relevant and accurate answers. 2 marks per set of name of organism + bad practice x 4 for 8 marks.

4. The term “food safety culture” is used commonly today. Besides training, what else do you think could contribute towards creating a positive food safety culture either at home/street food level or in the food industry, and why? (5 marks).
Regular communication with staff on food safety matters
Creating forums where staff can discuss food safety matters pertaining to their business
Encouraging participation by staff in important food safety decisions that need to be made by the organization
Engaging with staff on a regular basis to understand barriers they may identify that prevent a food safety culture from being realised in the organization
Creating an environment in which staff can report food safety issues in a non-threatened way
Creating incentives / reward system for staff to report food safety matters
Any 5 for 5 marks.
5. Bacteria "x" can double every 20 minutes under optimum (best) conditions. If an initial contamination level in a food is 20 cells/gram and the food weighs 200 grams, how many bacterial cells would be present in that food after 8 hours if the food presented optimum conditions for bacteria “x”? (4 marks).

Start: 20 cells/gram gives 4000 cells for the full portion of 200 grams (20x200 = 4000) = 1 mark. Number of replications = 24 (8 h = 480 minutes / 20 minutes) = 1 mark. Therefore after 8 h, there will be approximately (rounded off) 6.71 x 10^10 cells = 2 marks.

6. You are required to conduct a food safety audit on the food hygiene practices implemented by a supplier of one of your products (this can be a raw material such as raw vegetables, raw meat, food ingredients etc or it could be a final product that you may wish to stock and sell). Prepare a checklist of all the food hygiene requirements that you think should be included in such a food safety audit (20 marks).

1 mark per item in the checklist – any 20 items listed below are needed for 20 marks. Note that the checklist can be given in different formats e.g. statements or questions or any other format, all of which are acceptable provided they answer the question.

- Protective clothing of staff (this should be elaborated upon for maximum 3 marks e.g. hair net (or something similar); beard / moustache snoods; specific footwear; overalls or jackets / other form of covering; aprons etc)
- Personal hygiene practices of staff (this should be elaborated upon for maximum 3 marks e.g. no spitting/chewing gum etc; proper procedure for washing hands; no jewellery; no nail polish; no false nails or eyelashes; short clean nails etc)
- Eating and drinking only in designated areas
- Smoking only in designated areas
- Pest control (this should be elaborated upon for maximum 3 marks e.g. insectocuters for flies; bait stations for rats/mice; tending vegetation in surroundings; no holes / gaps in walls of buildings; keeping doors closed etc)
- Cleaning and disinfection (this should be elaborated upon for maximum 3 marks e.g. proper cleaning procedures for each area / equipment; cleaning schedules; using designated equipment only for cleaning purposes; ensuring cleaning equipment itself is kept clean; using only registered / appropriate cleaning chemicals (not household chemicals) are used etc.
- Appropriate procedures for receiving and storage of raw materials
- Ensuring hazardous chemicals are stored separately to any food materials
- Ensuring hazardous chemicals are stored in lockable area
- Floors are not porous and are easily cleaned
- Floors are either regularly cleaned or slope towards a drain
- Drain /sewage pipes are not located over products
- No stagnant water anywhere or in drains
- Only potable water is used for processing
- Maintenance programme for equipment
- Hygienic design of equipment
- Lights covered with polycarbonate material
- Glass windows laminated or replaced with polycarbonate material
- Glass breakage procedure
- Plaster policy
- Where products are high risk, ensure traffic and material flow is from high to low risk area
- Any other relevant point related to hygiene practices.
7. A raw fish is frozen prior to thawing, after which it is served as sushi (fish that is consumed raw).
   
a. Do you think that this food is high risk or low risk and why? (2 marks)
   High risk (1 mark) because there is no cooking step which kills pathogens and the product is going to be consumed raw (1 mark).

b. Of all the groups of pathogenic microorganisms mentioned in the module, which groups do you think could potentially be present before freezing? (3 marks)
   Bacteria (1 mark); viruses (1 mark); parasites (1 mark).

c. Regarding the pathogens you listed in (b) above, what do you think their sources could be? (4 marks)
   Contaminated water (with sewage for example); dirty/infected human hands when handling the fish; dirty equipment e.g. during slicing and gutting the fish; dirty surfaces upon which the fish has been placed; cross contamination of fish at any point; dirty boats / storage containers on the boat when fish is caught etc. 1 mark each for maximum of 4 marks.

d. Of all the groups of pathogenic microorganisms mentioned in the module, which of these do you think could potentially be present after freezing and why? (2 marks)
   Bacteria and viruses (½ mark each) because they can survive freezing whilst most parasites cannot (1 mark).

**TOTAL: 76 MARKS**