

IMK410 Test I 2021

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1. What will be a concern for food safety in relation to *Bacillus cereus*? Multiple answers
- (A) Spore formation that is resistant to environmental stresses
 - (B) Production of toxins
 - (C) Can cause both intoxication and toxico-infection
 - (D) Germination of the endospore
2. *Clostridium perfringens* is a foodborne pathogen that can cause...
- (A) Intoxication
 - (B) Systemic infection
 - (C) Toxico-infection
 - (D) Neuro-muscular disease
3. Which of the following methods is NOT suitable to control the growth of *Staphylococcus aureus* on food?
- (A) Adequate processing temperature to kill the pathogen
 - (B) Good hygiene practise for food handler
 - (C) Time-temperature control of the cooked food
 - (D) Use of suitable packaging
4. Which of the following is not the definitive host for liver fluke?
- (A) Human
 - (B) Cattle
 - (C) Sheep
 - (D) Snail
5. Transmission of *Giardia* & *Cryptosporidium* cysts is via.... (multiple answers).
- (A) Contaminated water
 - (B) Vegetables that have been washed or grown in potable water
 - (C) Rodent faeces & human faeces
 - (D) Faecal-oral route of poor personal hygiene

6. Choose the incorrect statement regarding foodborne parasites.

- (A) Live & reproduce themselves in foodstuffs
- (B) Always need a living host
- (C) Develop from egg into mature adult in a host
- (D) May involve one or more intermediate host

7. Major virulent factors for foodborne *Staphylococcus aureus*. Multiple answers.

- (A) Protein toxins
- (B) Lipotechoic acid
- (C) Surface adhesins & capsule
- (D) Resistance to multiple antibiotics

8. Which of the following most likely to be the transmission route for *Staphylococcus aureus* contamination?

- (A) Temperature controlled cooked food
- (B) Cross-contamination
- (C) Poor hygiene practice of the food handler
- (D) Adequate heating

9. Food implicated with *Listeria monocytogenes*.

- (A) Home-canned product
- (B) Chilled product
- (C) Low acid canned food
- (D) Infant formula

10. Choose the major virulent factors for *Listeria monocytogenes*. Multiple answers.

- (A) Ability to invade host cells
- (B) Escape from vacuole
- (C) Movement through cell via actin condensation
- (D) Can cross placenta

11. Choose the incorrect statement about *Listeria monocytogenes*.

- (A) Non-opportunistic pathogen
- (B) Can cause invasive and non-invasive types of foodborne illness
- (C) Non-invasive caused by ingestion large number of the organism (greater than $10^7/g$)
- (D) Invasive infection is rare but increasing and high mortality

12. Choose the foodborne pathogens that are unable to produce spore. Multiple answers.

- (A) *Listeria monocytogenes*
- (B) *Bacillus cereus*
- (C) *Salmonella spp.*
- (D) *Vibrio parahaemolyticus*

13. What will likely be the consequence of botulism intoxication?.

- (A) Tissue infection
- (B) Neurological disorder
- (C) Abortion or stillbirth
- (D) Diarrhoea

14. What does it mean by infant botulism?

- (A) Caused by eating foods that contain botulism toxin
- (B) *Clostridium botulinum* spores germinate in the wound
- (C) Caused by ingesting spores of the bacteria which germinate and produce toxin in the intestines
- (D) Aerosolized toxin is inhaled

15. Choose the correct answer regarding *Bacillus cereus* emetic syndrome.

- (A) Less severe than that of diarrheal syndrome
- (B) Ingestion of a toxin that has already been produced on the food
- (C) Incubation period is between 10-16 hours
- (D) Other symptom include diarrhea which lasts for 2 weeks

16. How does bacterial endospore can become a threat to food safety?

- (A) Ingestion of pre-formed spores on food
- (B) Sporulation of vegetative cells
- (C) Germination of spores and multiplication of vegetative cells
- (D) Free-living spores in the environment

17. Choose the factors allowing bacterial endospore to be able to withstand harsh condition. (Multiple answers).

- (A) Double cytoplasmic membrane
- (B) Double nuclear membrane
- (C) Dipicolinic acid
- (D) Calcium

18. A guest called a restaurant and told the manager about getting sick after eating there. The guest complained of vomiting and diarrhea with a moderate fever a few hours after eating a chicken dish. What pathogen probably caused the illness?

- (A) Typhoid fever
- (B) Paratyphoid fever
- (C) Non-typhoidal illness
- (D) Shigellosis

19. Which pathogen can be controlled by good hygiene practice and controlling the storage temperature of the food?

- (A) *Clostridium botulinum*
- (B) *Staphylococcus aureus*
- (C) *Bacillus cereus*
- (D) *Salmonella* spp.

20. What is the most important way to prevent a foodborne illness from parasites? Multiple answers.

- (A) Purchase from approved, reputable suppliers
- (B) Good personal hygiene
- (C) Control storage temperature
- (D) Prevent cross-contamination

21. Which of the following pathogen can cause bloody diarrhea in human?

- (A) *Salmonella* Typhi
- (B) *Salmonella bongori*
- (C) *Escherichia coli* O157:H7
- (D) *Cronobacter sakazakii*

22. Which pathogens are transmitted through the fecal-oral route? Multiple answers.

- (A) Hepatitis A virus
- (B) Hepatitis C virus
- (C) *Salmonella* Typhimurium
- (D) Norovirus

23. The following statements are true **EXCEPT**

- (A) Foodborne intoxication is caused by the ingestion of toxins produced by bacteria in foods
- (B) Raw and undercooked meat are the main sources of *Salmonella*, *Escherichia coli*, and *Campylobacter* spp.
- (C) *Salmonella* Typhi is a human-specific pathogen.
- (D) Foodborne infection caused by Hepatitis A virus can be treated with antibiotic.

24. Choose the **INCORRECT** statement about *Escherichia coli*

- (A) All serotypes of *Escherichia coli* are pathogenic and can cause gastroenteritis in human
- (B) "H antigen" defines serogroups and "O" antigen defines the serotypes in *E. coli*
- (C) Enterohaemorrhagic *Escherichia coli* (EHEC) secretes toxin without disrupting the cytoskeleton of host cell
- (D) Cytoskeletal rearrangement and pedestal formation in the epithelial cells could be a result of Enteropathogenic *Escherichia coli* (EPEC) invasion

25. Which of the following can cause attachment and effacement (A/E) lesions on epithelial cells? Multiple answers.

- (A) Enterohaemorrhagic (EHEC) *E. coli*
- (B) Enteropathogenic (EPEC) *E. coli*
- (C) Enterotoxigenic (ETEC) *E. coli*
- (D) Enteroaggregative (EAEC) *E. coli*

- 26.** Why the occurrence of *Vibrio parahaemolyticus* is higher in shellfish, especially oyster?
Choose the best answer.
- (A) Because *V. parahaemolyticus* is a halophilic bacterium that naturally present in the coastal area
 - (B) Oyster gives the best nutrition for the bacteria to grow
 - (C) Oyster is a filter-feeding shellfish that can accumulate the bacteria in their body
 - (D) *V. parahaemolyticus* and oyster have a symbiotic relationship that helps them survive in seawater
- 27.** The following are the characteristics of *Vibrio cholerae* **EXCEPT**
- (A) Able to survive in freshwater
 - (B) Produce cholera toxin
 - (C) Cause severe watery diarrhea
 - (D) Motile by peritrichous flagella
- 28.** What is the main characteristic of *Cronobacter sakazakii* that determines its survival in powdered infant milk?
- (A) It can produce biofilm on abiotic surface such as the feeding tube for infant
 - (B) It has the ability to utilize sialic acid that can be found in infant formula
 - (C) It is resistant to low pH environment in the intestines
 - (D) It is a facultative anaerobic bacterium that can live without oxygen
- 29.** Which of the following is the possible source of contamination for *Cronobacter sakazakii*
- (A) Improper sanitation for baby's feeding equipment
 - (B) Vegetables are washed using contaminated water
 - (C) Undercooked meat and chicken
 - (D) Asymptomatic carrier
- 30.** Choose the **CORRECT** statement about *Campylobacter* spp.
- (A) Rod-shape with peritrichous flagella
 - (B) Rod-shaped and motile by bipolar flagellum
 - (C) Livestock and poultry are the main reservoir for *Campylobacter jejuni*.
 - (D) *Campylobacter* produce TDH and TRH toxins.

31. Certain bacteria might produce toxins and cause disease to human. Choose the **correct** combination of bacteria and their toxins.

- (A) *Campylobacter jejuni* – patulin
- (B) Enterohaemorrhagic *E. coli* O157:H7 – Heat-stable (ST) & heat-labile (LT) toxins
- (C) Enterotoxigenic *E. coli* – Shiga-like toxin (Stx)
- (D) *V. parahaemolyticus* – TDH and TRH toxins

32. Choose the **INCORRECT** statements

- (A) Fish and shellfish are the reservoirs of *Aeromonas* spp. and *Vibrio* spp.
- (B) Norovirus can be easily spread by touching surfaces contaminated with vomit material
- (C) Infant can be expose to the risk of bacterial and mycotoxin contamination in milk.
- (D) Aflatoxins in peanut-based product can be eliminated by the heat treatment such as roasting and baking.

33. Which of the following fungi does not produce harmful mycotoxins?

- (A) *Aspergillus parasiticus*
- (B) *Aspergillus carbonarius*
- (C) *Fusarium verticillioides*
- (D) *Penicillium roqueforti*

34. Which of the following steps can help stop the spread of rotavirus among children, especially in the nursery? Multiple answers.

- (A) Give oral rehydration solution (ORS) to keep the children hydrated.
- (B) Washing hand after changing baby diapers
- (C) Clean and sanitize all food contact surfaces and utensils
- (D) Sanitize tables, floors, and toys

35. As a peanut butter manufacturer, choose suitable methods that can be useful in controlling aflatoxin contamination in the product. Multiple answers.

- (A) Avoid hot and humid conditions in the storage area
- (B) Perform aflatoxin screening test for the incoming raw materials (peanuts)
- (C) Perform manual sorting to eliminate moldy kernels
- (D) Keep the product in an airtight container

36. Which of the following method is **NOT** suitable to reduce the risk of vibriosis?

- (A) Separate cooked shellfish with raw shellfish and its juices
- (B) Wash hand with soap and water after handling raw shellfish
- (C) Eating raw oyster with lemon juice
- (D) Avoid getting brackish or saltwater if you have wound

37. Cholera disease can be prevented by these practices **EXCEPT**

- (A) Boil tap water before drinking
- (B) Get vaccination before travelling to countries where cholera is endemic
- (C) Always wash hand with soap and water after treating someone with cholera
- (D) Drink plenty of water to stay hydrated

38. Choose the best method to prevent foodborne illness associated with meat product

- (A) Frozen raw meat should be kept at - 4°C
- (B) Thaw frozen meat at room temperature to avoid microbial growth
- (C) Use colour code to differentiate cutting board used for raw meat and cooked meat
- (D) Cook steak safely at a minimum temperature of 80°C

39. Vaccines have been proven to be an effective means of prevention for foodborne illnesses caused by the following pathogens **EXCEPT**

- (A) Rotavirus
- (B) *Salmonella* Typhi
- (C) Hepatitis A
- (D) Norovirus

40. Which of the following method can help reduce the risk of *Cronobacter* infection in infant?
Multiple answers.

- A** Breast pump accessories should be clean and sanitize regularly
- B** Sterilize baby bottle in boiling water for 5 minutes
- C** Keep infant power in airtight container
- D** Infant formula should be consumed within 24 hours at room temperature