

# FISH TECHNOLOGY

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## **Justify of the following statements**

1. Flesh (fish meat) is important for human consumption.
2. The importance of homeostasis in fish processing and technology.
3. Some species of fish take longer than others to go into rigor.
4. Red fiber muscle is high in oxidative and low in glycolytic metabolism compared to white fiber muscle.
5. Reduce muscle temperature soon after fish death.

## **Complete the following sentences**

1. The term of fish processing is defined as ..... It can be divided into ..... and .....
2. Physical method is most accepted method to monitor rigor mortis progress due to ..... and .....
3. Characteristics of muscles which are related to their function can be classified into ..... and .....
4. In fish, the fillet consists of several muscles known as ..... While connective tissue sheaths are known as .....
5. The major post changes in muscle fish which are inter-related are ....., ....., ..... and .....
6. In muscles energy is required for ....., ..... and .....
7. The muscle quality changes if rigor not done properly are ....., ....., ..... and .....
8. Fish preservation is defined as ..... Factors to consider when selecting a preservation method are ....., ..... and .....
9. Fish is considered to be spoiled when ..... The main substances would limit the spoilage process are ....., ..... and .....
10. Fermentation as preserving fish method is worked by ..... The available techniques used for increasing the rate of fermentation are ....., ....., .....

11. Oldest method of preserving fish and considered as least costly method is ..... The flesh quality changes during this method are....., ..... and .....
12. Salting method is worked by ..... to delay microbial spoilage and chemical reactions of fish. The methods used for salting fish are ....., .....,..... and .....
13. A new technique to make fish safer is ..... the advantages of the technique are ..... and .....
14. The suitable method used for freezing whole fish or large cuts is ..... While for steaks and fillets is ..... or .....
15. The changes in flesh quality if rigor mortis is not done properly are ....., ..... and .....

**Explain the following questions using diagram**

1. Changes in the trend of fish meat industry.
2. Gross (altar) structure of fish skeletal muscle.

**Answer the following questions**

1. Which muscle type is interest to the meat industry? Why?
2. What are the differences between **TWO** of the following
  - A. Thick filaments and thin filaments.
  - B. Aerobic and anaerobic glycolytic pathway.
  - C. Living muscles and post-mortem muscles.
3. What are the characteristics of onset phase rigor mortis?

**Justify ONLY THREE of the following statements**

6. Ice is utilized in fish preservation.
7. Physical method is most accepted method to monitor rigor mortis development in fish.
8. Fish catch handling during fisheries is important for fish meat industry.
9. Salt and calcium phosphate are used as meat additives for reducing water loss in fish meat.
10. Lipid oxidation is the most common chemical action wh ich causes spoilage in fatty fish.

**Explain FOUR of the following questions using diagram**

3. The process of smoked fish.
4. Fish spoilage through enzymatic action.

5. The role of nitrate during curing fish process.
6. The process of canning fish.
7. Glycolytic pathway of flesh pH decline after 24 hours postmortem

**Answer the following questions**

4. What are the roles or benefits of **TWO** of the following
  - A. Pre-cooking during canning fish
  - B. Phenols component during smoking fish
  - C. Alkaline Phosphates during curing fish.
5. What are the differences between **ONE** of the following
  - A. Fast and slow freezing of fish
  - B. Hot and cold smoking of fish
6. What are the important changes brought out by the action of the bacteria in fish?
 

a 1 adult bovine	b 1 adult bovine :	c 1 adult bovine :	d 1 adult bovine :
: 2 pigs	: 3	3 pigs	: 3
calves	: 5	: 10 sheep	calves
sheep			: 5
			calves
			: 6
			sheep
9. The colour of the pigment nitrosohemochromogen is \_\_\_\_\_
 

a brown	b pink	c red	d bright red
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10. Casings prepared from small intestine of sheep are called \_\_\_\_\_
 

a weasand	b middles	c bungs	d rounds
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11. Average protein content of carcass meal \_\_\_\_\_
 

a 50%	b 30%	c 70%	d 40%
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12. Cytoplasm of muscle fiber is called as \_\_\_\_\_
 

a protoplasm	b sarcoplasm	c sarcomere	d ground substance
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13. Bacterial spoilage in chilled meat is due to bacteria of \_\_\_\_\_ group
 

a psychrophilic	b mesophilic	c thermophilic	d microaerophilic
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14. Meat pattice are cooked in an oven to an internal temperature of \_\_\_\_\_
 

a 70 °C	b 90 °C	c 60 °C	d 85 °C
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15. Glycogen content of normal bovine muscle ranges from \_\_\_\_\_

a 0.5-1.3%      b 0.1-1%      c 2 – 3.5 %      d 1- 3 %

16 When meat is frozen slowly the largest crystals are formed \_\_\_\_\_

a inside muscle fiber      b between muscles      c out side muscle fiber      d between epi and perimysium

17 The temperature of the retort during canning of meat chunks is \_\_\_\_\_

a 100 °C      b 120 °C      c 150 °C      d 200 °C

18 The radiation dose of \_\_\_\_\_ is sufficient to kill the pathogenic bacteria.

a 0.1 M rad      b 1 M rad      C 1.5 M rad      d 2 M rad

19 Water activity in intermediate moisture foods is maintained between \_\_\_\_\_

- a 0.6 – 0.85%      b 0.3 – 0.4 %      c 0.8 – 1 %      d 0.2 – 0.5 %
- 20 Freezing point of meat lies between \_\_\_\_\_
- a - 1 to –1.5 °C      b - 2 to – 0 °C      c 0 to – 3 °C      d - 1 to 0 °C
- 21 Scalding temperature in pigs is about \_\_\_\_\_
- a 50 - 55 °C      b 62 - 64 °C      c 70 - 85 °C      d 90 °C
- 22 Animals should be bled within \_\_\_\_\_ seconds after electrical stunning to avoid muscle splashing.
- a 60 sec      b 30 sec      c 90 sec      d 10 sec
- 23 The end product of ATP break down responsible for flavour is \_\_\_\_\_
- a hypoxanthine      b furfural      c creatinine      d furfural
- 24 The characteristic yellow colour of egg yolk is due to \_\_\_\_\_
- a carotene      b vitamin- a      c biotin      d xanthophyll
- 25 Brucellosis is also known as \_\_\_\_\_
- a BVD      b bangs diseased      c black disease      d mucosal disease
- 26 Since Jan 2001 Britain is facing a severe crisis in beef production due to out break of \_\_\_\_\_
- a FMD      b RP      c Mad cow disease      d Brucellosis
- 27 Strength of pickle solution is measured by \_\_\_\_\_
- a Barometer      b Torry meter      c Gyrometer      d Salinometer
- 28 Emulsion is prepared in \_\_\_\_\_
- a Tumbler      b Homogenizer      c Flaker      d Bowl chopper
- 29 The carcinogenic compounds in smoke are \_\_\_\_\_
- a benzyl pyrenes      b carbonyls      c aldehydes      d PAH
- 30 Case on systems of dressing is used in \_\_\_\_\_

- a cattle                      b buffalo                      c sheep                      d pig
- 31 Each muscle fiber is covered by \_\_\_\_\_
- a perimycium      b epimysium      c endomysium      d fascia
- 32 Bacon is prepared from \_\_\_\_\_
- a boston butt      b leg portion      c picnic shoulder      d bellies
- 33 Multiplication of bacteria is highest during \_\_\_\_\_ phase of growth.
- a lag phase      b log phase      c phase of + ve acceleration      d stationary phase
- 34 The indicator of fecal contamination is \_\_\_\_\_
- a E.coil      b Salmonella      c S.faecalis      d S. bovis
- 35 Iodine no. in horse fat is \_\_\_\_\_.
- a 70 - 85      B 35 - 46      c 50 - 70      d 30 - 50
- 36 Dressed chicken can be stored in a refrigerator at 2°C for \_\_\_\_\_.
- a 7 days      b 2 days      c 10 days      d 15 days
- 37 The fat content of chicken egg albumen is \_\_\_\_\_
- a 0.2 %      b 10 %      c 15 %      d 20 %
- 38 Green rot in egg is caused by \_\_\_\_\_
- a Pseudomonas      b Staphylococcus      c Serratia      d Cladosporium
- 39 During ageing the lysosomal enzymes act at the pH \_\_\_\_\_
- a below pH 6      b 7 - 9      c 10      d 12
- 40 The optimum concentration of CO<sub>2</sub> gas in stunning of pigs is \_\_\_\_\_
- a 70%      b 20%      c 50%      d 90%
- 41 Parasites in meat such as *Cysticercus bovis* and *Trichenella spiralis* are killed by \_\_\_\_\_

- a 0.01 – 0.1 M rad    b 0.5 – 1 M rad    c 1 – 2 M rad    d 10 M rad
- 42 The voltage during electrical stunning of sheep is usually\_\_\_\_\_
- a 40 V                    b 75 – 80 V                    c 90 V                    d 120 V
- 43 Speed of freezing of meat is the time taken to pass from\_\_\_\_\_
- a 0 to -5<sup>0</sup> C                    b +2 to -2<sup>0</sup> C                    c +1 to -1<sup>0</sup> C                    d +5 to -2<sup>0</sup> C
- 44 Antibacterial action of cloves is due to\_\_\_\_\_
- a eugenol                    b isothiocyanate                    c carbonic acid                    d phenol
- 45 Wet dog flavour is typical of \_\_\_\_\_
- a AFD meat                    b Irradiated meat                    c chilled meat                    d cooked meat
- 46 The product corned beef, the corn refers to\_\_\_\_\_
- a Corn flavour                    b granulated salt                    c Na – Nitrite                    d polyphosphate
- 47 A minimum of\_\_\_\_\_nitrite is necessary to ensure normal colour and flavour in cured meats.
- a 20 – 40 ppm                    b 100 ppm                    c 200 ppm                    d 10 ppm
- 48 Bound water forms about\_\_\_\_\_% of the total water content in meat
- a 10 %                    b 5 %                    c 20 %                    d 25 %
- 49 Ultimate pH of meat protein is\_\_\_\_\_
- a 4.5                    b 5.4                    c 5                    d 4
- 50 The moisture content of AFD meat is \_\_\_\_\_
- a 2%                    b 10%                    c 15%                    d 20%
- 51 W.B. Shear force meter measure the strength required in\_\_\_\_\_of meat.
- a biting                    b tearing                    c chewing                    d cutting
- 52 Thaw rigor is caused by the activity of\_\_\_\_\_enzyme
- a lysozyme                    b protease                    c ATPase                    d lipase
- 53 For preparing fermented sausages the\_\_\_\_\_culture is used.
- a Lactobacillus                    b Leuconostock                    c Achromobactor                    d Pseudomonas
- 54 \_\_\_\_\_ions are responsible for muscle contraction
- a Na                    b K                    c Ca                    d SO<sub>4</sub>
- 55 Recovery of fat from the dead carcasses is called as \_\_\_\_\_
- a rendering                    b simmering                    c braising                    d pasteurization



- 71 \_\_\_\_\_ is the most tender cut in beef carcass.  
 a Rump                      b Short plate                      c Chuck and blade                      d Sirloin
- 72 Colour of rabbit meat is \_\_\_\_\_  
 a pale brown                      b red                      c cherry red                      d pink
- 73 Main objective of adding salt during meat emulsion preparation is \_\_\_\_\_  
 a to extract myofibrillar proteins                      b antioxidant                      c antimicrobial                      d flavour
- 74 \_\_\_\_\_ is the GRAS chemical additive  
 a citric acid                      b  $\text{KMnO}_4$                       c Sodium hypochlorite                      d benzylpyrines
- 75 Technical fat is used in manufacture of \_\_\_\_\_  
 a soap                      b fat liquor                      c lubricant                      d edible oils
- 76 Fatty acid composition of oils can be estimated by \_\_\_\_\_  
 a TLC                      b GLC                      c Refractometer                      d AAS
- 77 Average dressing % in Indian goats is about \_\_\_\_\_  
 a 35-50%                      b 55%                      c Above 70%                      d 60%
- 78 \_\_\_\_\_ instrument is used to measure the smoke density in smoke houses.  
 a Electric eye                      b Plannimeter                      c Ameter                      d Densitometric scan
- 79 Alarm water content in fat free dehydrated meats is \_\_\_\_\_  
 a 15%                      b 30%                      c 40%                      d 50%
- 80 Ruffle fat is a fat around \_\_\_\_\_  
 a kidney                      b mesentery                      c thoracic region                      d rectum
- 81 Haugh index is used to determine the internal quality of \_\_\_\_\_  
 a milk                      b meat                      c paneer                      d egg
- 82 \_\_\_\_\_ initiated the concept of canning of foods.  
 a B.Franklin                      B R.A.Lawrie                      c N.Appert                      d R.Hamm
- 83 The food poisoning caused by *Bacillus cereus* is referred as \_\_\_\_\_  
 a infection                      b infestation                      c intoxication                      d ingestion
- 84 The quality standards for foods all over the world are monitored as per \_\_\_\_\_  
 a ISO                      b APEDA                      c OIE                      d FAO
- 85 Yellow fever is an example of \_\_\_\_\_ zoonoses

- a direct zoonoses    b meta zoonoses    c cyclo zoonoses    d sapro zoonoses
- 86 An association between two organism in which both are benefited is \_\_\_\_\_  
a symbiosis    b synnecrotic    c antagonism    d mutualistic
- 87 Mycobacterium piscium causes T.B.in \_\_\_\_\_  
a cattle    b sheep    c frog    d birds
- 88 Anthrax is also known as \_\_\_\_\_  
a Charbon    b Struck    c Weil's disease    d Undulant fever
- 89 Clenbutarol is an \_\_\_\_\_  
a growth promoter    b antiseptic    c antibiotic    d lipolytic agent
- 90 \_\_\_\_\_ are the principal host for Leptospirosis  
a cattle    b man    c lizard    d rodent
- 91 All organophosphorous compounds produce \_\_\_\_\_ residue in tissues.  
a little or no    b moderate    c high    d heavy
- 92 \_\_\_\_\_ is taken for toxic residue analysis.  
a liver    b heart    c spleen    d intestine
- 93 The method of packing dressed broiler chicken is known as \_\_\_\_\_  
a trussing    b wrapping    c tetrapacking    d none of the a,b,c
- 94 Scalding temperature for turkey is usually \_\_\_\_\_ -  
a 60° C for 60 sec    b 53 ° C for 120 sec    c 60° C for 120 sec    d 93 ° C for 5 sec
- 95 Meat bone ratio in dressed broiler is approximately \_\_\_\_\_  
a 4:1    b 2:1    c 3:1    d 5:1
- 96 National Research Center on meat is situated in \_\_\_\_\_  
a Bombay    b Calcutta    c Hyderabad    d Delhi
- 97 In India, processed meat products from chicken are manufactured by \_\_\_\_\_  
a Lipton    b Venkys    c Hindustan liver    d Griffon
- 98 Meat analogues are prepared from \_\_\_\_\_  
a pork    b vegetable proteins    c beef    d mutton
- 99 The enzyme present in chalyza of chicken gee which has antibacterial effect is \_\_\_\_\_  
a lysozyme    b amylase    c protease    d pectinase

100 Meat containing sarcocyst is\_\_\_\_\_

- a rejected on aesthetic ground  
b rejected due to zoonoses  
c passed  
d passed with caution of cooking