FAQs

1. **How does pH play a vital role in ante-mortem meat?**

Once the animal dies, the muscle pH becomes more acidic in nature i.e the pH falls below 7. This is due to the conversion of carbohydrates such as glycogen, glucose (which are the energy reservoirs of the muscle) to lactic acid via a biochemical process termed as glycolysis. The higher the amount of glycogen in the muscle, greater is the amount of lactic acid formed. A concentration of about 1% is sufficient to result in the production of lactic acid to bring down the pH to about 5.5. In case of unstressed animals, the normal ultimate pH of muscle is in the range 5.5 – 5.7 and muscle of this pH has a normal appearance and texture. In cases where the muscle was depleted of glycogen before death, the pH fall will be much less. Meat which has a pH or 6 or higher will have significantly different properties such as darker colour, firmer and drier meat (DFD meat). Spoilage bacteria will grow rapidly in meat of high pH.

2. **What is meat exudates?**

When meat is stored, a liquid known as weep exudates from it. Excess weep is undesirable as it detracts the visual appearance of the meat and results in effective loss of the product. The volume of weep can be influenced by a variety of factors such as area of cut surface of the muscle and storage temperature. The most important factor being pH because high pH favours water retention and less exudates is produced.

3. **What is the freezing point of meat?**

Water in meat is made of a solution of salts which begins to freeze at -1.5^0 c in contrast to pure water which freezes at 0^0 c. The optimum storage life of non – frozen fresh meats is achieved at -1^0 c. At this temperature, bacterial growth is extremely slow and the biochemical changes which occur during storage occur at a minimum rate.

4. **What are the factors affecting the growth of microorganisms on meat.**

The factors affecting the growth of microorganisms on meat are:

a. Temperature
b. Gas atmosphere
c. Water activity
d. pH
e. contaminating microorganisms
f. Chemical inhibitors

5. **How does gas atmosphere and water activity affect the quality of meat?**

In the presence of carbon dioxide, the growth of certain types of microorganisms is inhibited. This happens in the absence of oxygen as well. This is usually by the manipulation of the redox potential. Nitrogen is inert in terms of microbial growth.

Water is essential for the growth of microorganisms. As water content is reduced, growth rates get reduced. Water activity is the term used to specify the amount of water that is available or "active" in a food i.e water which is not chemically bound. The water activity in carcass meat is 0.99.

6. **How does temperature and pH play a role in ante – mortem stages of meat?**

Growth rates at $0 – 1^0$ c are only about half of those at 5^0 c and are further reduced as temperature falls. A storage temperature which can be maintained as low as possible should be practiced, keeping in mind the product and circumstances. Usually, a temperature of -1^0 c is optimal.

Most of the microorganisms can grow in a pH range of 5.4 – 7.0. This factor becomes important coupled with the others. For example, if lean red meat is placed in an environment where oxygen is no longer available, the composition of the flora which will grow is largely influenced by the muscle pH.

7. **How do contaminating microorganisms and chemical inhibitors affect meat?**

Certain species of microorganisms are capable of inhibiting the growth of others. This can happen actively, by the production of antibiotic like compounds or toxic metabolites or passively by the competition for nutrients.

In the case of processed meats, the addition of certain ingredients to meat results in a modification of the microbial flora present. For instance, the concentration of salt used in processed meats is usually high enough to prevent the growth of *Pseudomonas* species and the level of sodium nitrite used in curing reduces the growth of certain spoilage microorganism species.

8. **What are the major objectives of antemortem examination of meat?**

The major objectives of ante-mortem examination of meat are as follows:

- To screen all the animals which are to be slaughtered
- To make sure that the animals are properly rested and to obtain proper clinical information which will assist disease diagnosis
- To check contamination on the killing floor by separating dirty animals and condemning the diseased animals if required by regulation
- To ensure that injured animals or those suffering from any kind of pain receive emergency slaughter and that animals are treated humanely
- To identify reportable animal diseases to prevent killing floor contamination

- To identify sick animals and those being treated with antibiotics, chemotherapeutic agents, insecticides and pesticides
- To ensure the cleaning and disinfection of trucks which are used for the transportation of livestock.

9. What are the abnormalities which are checked on antemortem examination of meat?

Some of the abnormalities which are checked on antemortem examination include:

1. Abnormalities in respiration
2. Change in behavior
3. Abnormalities in gait and posture
4. Abnormalities in structure and conformation
5. Abnormal discharges or protrusions from body openings
6. Abnormal colour and odour

10. How are the abnormalities in animal behavior manifested?

Abnormalities in respiration commonly refer to frequency of respiration. If the breathing pattern is different from normal the animal should be segregated as a suspect.

Abnormalities in behavior are manifested by one or more signs such as the animal may be walking in circles or show an abnormal gait or posture. It may be pushing its head against a wall, charging at various objects and act aggressively, show a dull and anxious expression in the eyes. An abnormal gait in an animal is associated with pain in the legs, chest or abdomen or is an indication of nervous disease.

11. How are abnormalities in structure of animals manifested?

Abnormalities in structure (conformation) are manifested by:

1. Swellings or abscesses
2. Enlarged joints
3. Umbilical swelling which is associated with hernia or omphalophlebitis
4. Enlarged sensitive udder indicative of mastitis
5. Enlarged jaw which is often called “lumpy jaw”
6. Bloated abdomen

12. Write on abnormal discharge and abnormal odor in animals.

Abnormal discharges from the body include discharges from the nose, excessive saliva from the mouth, protrusions from the vulva, intestine, rectum, uterus, vagina, growths on the eye and bloody diarrhea. Abnormal colour such as black areas on horses and swine, red areas on light coloured skin which is inflammation, dark blue areas on the skin or udder (gangrene).

An abnormal odour is usually difficult to detect under a routine antemortem examination. The odour of an abscess, a medicinal odour, stinkweed odour or an acetone odour of ketosis may be observed. Since most abattoirs in developing countries do not have accommodation station for animals, the inspector's have to perform antemortem examination at the admission of slaughter animals.

13. How is post mortem inspection carried out?

Postmortem examination of a carcass needs to be carried out as soon as possible once the dressing is completed so that any abnormalities can be detected. This facilitates the products to be conditionally fit in for human consumption. All organs and carcass portions should be kept together and correlated for inspection before they are removed from the slaughter floor. Postmortem inspection should give all the relevant information which is needed for the scientific evaluation of pathological lesions pertinent to the wholesomeness of meat. The following criteria should be considered:

1. Viewing, incision, palpation and olfaction techniques
2. Classifying the lesions into two types – acute or chronic
3. To classify whether the condition is localized or generalized and also to assess the extent of systemic changes in other organs or tissues
4. To determine the significance of primary and systemic pathological lesions and their relevance to the major organs and systems, particularly the liver, kidneys, heart, spleen and lymphatic system.
5. Coordinating the components of antemortem and postmortem findings to make a final diagnosis
6. Submitting the samples to the laboratory for diagnostic support, if in case abbatoir has holding and refrigeration facilities for carcass under detention.

14. Differentiate between localized and generalized conditions.

In a localized condition, a lesion is restricted by the animal defense mechanisms to a certain area or organ. Systemic changes associated with a localized condition may also occur. For example, jaundice caused by liver infection or toxaemia flowing pyometra which is an abscess happening in the uterus.

In a generalized condition, the defense mechanism of the animal is not able to stop the progression of the disease by way of its circulatory or lymphatic systems. The lymph nodes of the carcass has to be examined if pathological lesions are generalized.

15. Differtiate between acute and chronic conditions.

An acute condition implies that a lesion has developed over a period of few days, whereas a chronic condition refers to the development of lesions over a period of some weeks, months or even years. The acute condition is characterized by the inflammation of different organs and tissues, enlarged haemorrhagic lymph nodes and haemorrhage of the mucosal and serous membranes and different organs like the heart, kidney and liver. An acute infection progresses in parallel with generalized disease complex, when an acute infection tends to overcome the animals immune system and become generalized. Each of the cases which show systemic lesions should be individually assessed taking into consideration the significance of these lesions towards major organ systems, especially the liver, kidneys, heart, spleen and lymphatic system as well as the general condition of the carcass.