

## Qualities of fresh meat

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### Introduction

Meat quality is defined as a measurement of attributes or characters that determine the suitability of meat to be eaten as fresh or stored for reasonable period without deterioration. qualities of fresh meat are pH, water holding capacity, colour, odour, juiciness, texture, tenderness and firmness

### Why fresh meat quality is important

- Meat quality and consistency are important in ensuring consumer satisfaction.
- Meat quality and safety are highly relevant issues for the meat industry worldwide as it is directly linked to public health and welfare.
- Consumers want the meat they eat to not only taste better but also be safe, nutritious, and have an extended shelf life

### Specific parameters for meat quality

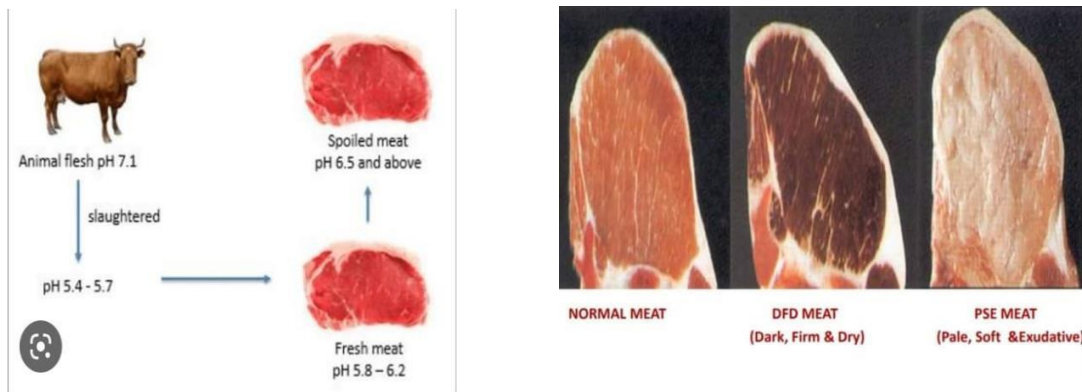
- pH
- Water holding capacity
- Colour
- Odour
- Juiciness
- Texture
- Tenderness
- Firmness

### Meat pH

- Ultimate pH of meat is meat pH after undergoing postmortem glycolysis.
- Meat pH is related to water holding capacity, cooking loss, and tenderness.
- Meat pH decreases after the slaughter of animals.
- Decrease in pH is caused by the occurrence of anaerobic postmortem glycolysis which produces lactic acids.



- The more glycogen supply stored during slaughter, the lower ultimate pH of meat.
- The pH of fresh meat at 45 minutes post slaughter is in the range of 6.8 -7.2, which reduces to about 5.2-5.6, at about 24 hours post slaughter in cattle, while it takes in about 4-8 hours in pigs.
- Meat pH is related to WHC, meat juice, tenderness, cooking loss, i.e. an increase in pH will increase meat juice and WHC, but decrease cooking loss.



### Factors affecting ultimate meat pH

- Pre-slaughter factors: - age, species, breeds, types of animals, resting, slaughter method, type of muscle, muscle location, muscle glycogen supply.
- Post-slaughter factors: electrical stimulation, chilling, aging, storage, and cooking.

### Meat Colour

This is the total visual perception of meat. Different meat colors are caused by different concentrations of myoglobin, chemical state of myoglobin (myoglobin, oxymyoglobin, metmyoglobin). It is for this reason that meat colour varies with species, age and even among different muscles of the same species.





- Due to exposure to air, myoglobin is oxygenated to form oxymyoglobin. Oxymyoglobin has a bright red colour which is very much desired by the consumers. In conditions of less oxygen myoglobin as well as oxymyoglobin is oxidized to brown coloured metmyoglobin.
- The factors affecting meat color are: feeding, species, breeds, age, sex, muscle activity, pH, and oxygen.
- Meat pigment consists of myoglobin, chromoprotein, and hemoglobin. Different meat colors are caused by different concentrations of myoglobin, chemical state of myoglobin (myoglobin, oxymyoglobin, metmyoglobin), and chemical and physical state of other components in meat.
- Myoglobin is sarcoplasmic protein of single polypeptide chains bound in the surrounding of heme group which bring oxygen.
- The amount of myoglobin in veal is 1-3 mg/g, in beef 4-10 mg/g, and in older beef 16-20 mg/g
- Myoglobin undergoes changes in PSE meat, caused by a very rapid decrease in postmortem pH.
- The concentration of myoglobin increases with age so that older animals have darker color.
- Muscle differences cause meat color differences because each muscle has different activities, resulting in different supply of O<sub>2</sub>.
- Different colors of meat surface are caused by chemical state of myoglobin, i.e. bright red (oxymyoglobin), brown (metmyoglobin).
- Temperature affects cooked-meat color, i.e. meat which is cooked at the temperature of 60°C has bright red color, and at 70-80°C has grayish brown color.
- Myoglobin undergoes denaturation at the heating temperature of 80-85°C.