EXPERIMENT 4 DETERMINATION OF pH OF MEAT

Structure

4.1 OBJECTIVES

After reading and performing this experiment, you will be able to:

- define pH of the meat;
- determine the pH of the meat sample given to you; and
- operate the pH meter for measuring the pH of different materials.

4.2 INTRODUCTION

The pH of meat is an important parameter, which signifies the functional properties and keeping quality of meat on subsequent storage. pH influences the quality of meat i.e., colour, tenderness, flavour, water binding properties and shelf life. Measurement of pH can therefore reveal the quality of meat and offers an indication, whether the meat is suitable for manufacture of good quality products.

The pH of fresh meat may change due to the metabolites of bacterial action during storage. Depending upon the type of spoilage, normally the pH increases and may reach up to 8.5.

The ultimate pH varies in different species and various muscles of the same carcass. Struggling of animals before slaughter results in markedly low initial pH and early passing of rigor mortis.

4.3 EXPERIMENT

4.3.1 Principle

pH is a symbol which represents the acidity or alkalinity of a substance. It is defined as a negative logarithm of H^+ ion concentration. It ranges from 1.0 (highly acidic) to 14.0 (highly alkaline) with 7.0 being neutral.

4.3.2 Requirements

Apparatus

- pH meter : Regular (direct) or digital. (combined electrode or glass and reference electrodes)
- Blender or pestle and mortar
- Weighing balance
- Measuring cylinder
- Measuring pipette
- Volumetric flask: 100ml
- Beaker: 100 ml and 250 ml
- Funnel
- Wash bottle for distilled water.
- Filter paper: Whatman No. 54
- Tissue paper

Buffer solutions of pH 4, 7 and 10

- pH buffer tablets of different pH
- Distilled water

4.3.3 Procedure

Preparation of Buffer Solution:

- Take one tablet each of different pH viz. 4,7,10.
- Powder the tablet (each tablet separately) in a mortar using pestle.
- Dissolve (each tablet separately) in small quantity of distilled water.
- Transfer quantitatively and carefully to a 100 ml volumetric flask (each tablet separately).
- Repeat the washings 3 to 4 times.
- Make up the volume to 100 ml using a pipette.
- Standard buffer solutions of pH-4, pH-7 and pH – 10 are ready for use for standardization of pH meter.

Measurement of Meat pH:

- Weigh accurately 10g of meat sample

- Add 90 ml of distilled water/deionized water and blend for a minute or so in a blender.
- Standardize the pH meter after cleaning the electrodes and immersing in to distilled water.
- Observe the thermo – compensator for buffer and sample.
- Standardize the pH meter to buffer which is close to your sample to be analyzed.
- Wash the electrodes with distilled water and wipe the electrodes with filter paper/tissue paper and place the electrodes in the beaker containing distilled water.
- Insert or dip the electrodes again in to test sample. Wait until the indicator or digital control is stable (slight fluctuation can be considered).
- Read and record the pH (twice).
- Wash the electrodes thoroughly with distilled water twice. Wipe off the electrodes with filter paper/tissue paper. Then place the electrode in a beaker containing distilled.

4.3.4 Observation

pH Measurements

Record atleast two reading for each sample.

(i)

(ii)

$$\text{Average} = \frac{(i) + (ii)}{2}$$

4.3.5 Result

The pH of the given sample is =.....

4.4 PRECAUTIONS

- pH meter should be switched on 10 minutes in advance.
- The electrode of pH meter should not get dried and whenever pH meter is not in use, electrode should be dipped in water.
- There should not be temperature difference between standard solution and sample to be analyzed.
- Always rinse and wipe out electrode properly before another sample is tested.
- Water used for electrode washing should be deionized, otherwise it affects the accuracy of measurement.