

# **COMPOSITION OF MUSCLE- II**

**(A PART OF UNIT IV- 3<sup>RD</sup> PROF. YEAR)**

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# Composition of Muscle

▣ Water 75% & Solids 25%

**Protein- 19%**

**Lipids- 2.5%**

**Carbohydrates- 1.0-1.2%**

**Nitrogenous Subst.- 1.50-1.65%**

**Inorganic Subst.- 0.65%**

**Vitamins- traces**

# LIPIDS

2.5%

## Types

**Neutral Lipids**

(1%)

**Phospholipids**

(1%)

**Cholesterol**

(0.5%)

- ▣ Major component of carcass of meat animal
- ▣ Highly variable component.
- ▣ Neutral lipids are glycerol esters of straight chain carboxylic acids or triglycerides with small amount of mono & diglycerides.
- ▣ Phospholipids are principal structural & functional constituent of cell membrane.
- ▣ Cholesterol is a minor component of animal tissue present in unesterified or free form

# Neutral Lipids

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graph TD; A[Neutral Lipids] --> B[Saturated Fatty Acid]; A --> C[Unsaturated Fatty Acid];
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**Saturated Fatty Acid**

**Palmitic Acid**

**Stearic Acid**

**Unsaturated Fatty Acid**

**Oleic Acid**

**Linoleic Acid**

**Linolenic Acid**

# Phospholipids

- ▣ **Play a key role in shelf stability and flavor of meat.**
- ▣ **More susceptible to oxidation than triglycerides.**
- ▣ **Key factor responsible for development of off-color and rancidity.**
- ▣ **Generally found as**

**Phosphoglycerides**

**Phosphatidyl Choline**

**Phosphatidyl ethanolamine**

**Phosphatidyl serine**

**Sphingomyelins.**

# Cholesterol

- ▣ **An essential dietary compound.**
- ▣ **Required for hormone function and cell wall integrity.**
- ▣ **Manufactured in the body; 80% of the requirement synthesized in body rest 20% obtained from external source.**
- ▣ **Cooked meats do not vary much on cholesterol content**

# Carbohydrates

**1% found in muscles  
as glycogen.**

**Range- 0.5-1.5%**

**Found exclusively in  
muscle, never in  
meat.**

**Plays an important  
role in meat  
properties and  
appearance.**

- ▣ **Plays a critical role in attaining the ultimate pH of meat**
- ▣ **Both rate and amount of glycolysis influences color, tenderness and water holding capacity of meat.**

# Non-Protein-Nitrogen

- **Molecules containing nitrogen but are not proteins**
- **Contributes to meat flavour**
- **Ex. ATP, Creatinine, Nucleotides, Inosine Phosphate etc.**



# Inorganic Substances

- ❖ Ranges from 0.5-1.0% of the total muscle content.
- ❖ Measured as ash , obtained after complete burning of sample in a muffle furnace.
- ❖ Meat is a good source of minerals like Iron and Zinc.
- ❖ Iron available in meat in form of haeme whereas Zinc present in enzyme and hormones.

# Vitamins

- ❖ Content varies with age of animal.
- ❖ Contains both fat soluble (A,D,E & K) and water soluble vitamins (B complex); except Vitamin C.
- ❖ Water soluble vitamins are localized in lean tissue whereas fat soluble vitamins in fatty tissues.
- ❖ Variety meats rich in vitamin B complex.

# Vitamins contd....

- ❖ Pork and mutton high in thiamine content.
- ❖ Pork contains 5-10 times thiamine than mutton.
- ❖ Most vitamins are stable during cooking.
- ❖ Thiamine and vitamin B6 susceptible to heat treatment.

THANK YOU