

COMPOSITION OF MUSCLE- II

(A PART OF UNIT IV- 3RD 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