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Meat Hygiene

Lec1

Meat Hygiene.

Meat: is the common term used to describe the *edible portion* of animal tissues.

Hygiene: Is a set of practices performed for the preservation of Health Meat hygiene make sure that meat is safe, and that its production and processing satisfies hygiene laws.

Purposes of meat hygiene.

- To prevent the transmission of animal diseases to man
- To provide safe, wholesome meat products for human consumption
- The reduction of loss of meat and its by-products
- The prevention of animal disease transmission to other domestic animals
- To prevent the sale and consumption of meat that is inferior in value

Meat hygiene could involve:

1. Inspecting the hygiene in slaughterhouses, cutting plants, factories, and cold stores
2. Checking animal welfare conditions
3. Inspecting live animals, game or poultry for any signs of disease
4. Carrying out postmortem's inspection.
5. Checking meat transportation conditions.
6. Making sure that unfit meat is destroyed properly.

7. Recording the findings from your inspections.
8. Recommending any improvements that need to be made.
9. Making sure that improvements are carried out.

Definition of meat for human consumption.

- Meat is the common term used to describe the **edible** portion of animal tissues. In this context, meat can be defined as "**the muscle tissue of slaughter animals".**
- Meats are often classified by the **type of animal** from which they are taken.

1. Red meat refers to the meat taken from mammals.
2. White meat refers to the meat taken from fowl.
3. Seafood refers to the meat taken from fish and shellfish.
4. Game refers to meat taken from animals that are not commonly domesticated.

In addition, most commonly consumed meats are specifically identified by the live animal from which they come.

1. Beef refers to the meat from cattle ,
2. Veal from calves,
3. Lamb from young sheep,
4. Mutton from sheep older than two years.

Composition of meat.

- In general, meat is composed of:
  1)Water.
  2)Fat.
  3)Protein.
  4)Minerals.
  5)Small proportion of carbohydrate.
- The value of animal foods is essentially associated with their content of protein.

The lean component of red meat is:

- An excellent source of high biological value protein, vitamin B12, niacin, vitamin B6, iron, zinc and phosphorus
- A source of long-chain omega-3 polyunsaturated fats, riboflavin, pantothenic acid, selenium and, possibly, also vitamin D.
- Relatively low in fat and sodium.
- A source of a range of endogenous antioxidants and other bioactive substances, including taurine, carnitine, carnosine, ubiquinone, glutathione, and creatine.

Table 1 shows the chemical composition of fresh raw and processed meats.

	Product	Water	Protein	Fat	Ash	Calories /100g
FRESH meat	Beef (lean)	75.0	22.3	1.8	1.2	116
	Beef carcass	54.7	16.5	28.0	0.8	323
	Veal (lean)	76.4	21.3	0.8	1.2	98
	Chicken	75.0	22.8	0.9	1.2	105
	Venison (deer)	75.7	21.4	1.3	1.2	103
	Beef fat (subcutaneous)	4.0	1.5	94.0	0.1	S54

- The value of animal foods is essentially associated with their content of **proteins**.

- Protein is made up of about 20 amino acids.

- Approximately 65% of the proteins in the animal body are skeleton muscle protein,
- 30% connective tissue proteins (collagen, elastin)
- and the remaining 5% blood proteins and keratin (hairs, nails).
- All organ meats (except tripe) are extremely rich in vitamin B12•

- Liver is a rich source of protein, iron, zinc, riboflavin, niacin, vitamin A and folate.
- Kidney is rich in protein, thiamin, riboflavin, iron and a source of folate.
- Heart is a good source of iron and zinc, but not as good as liver and kidney.
- All organ meats are high in cholesterol, especially brains, and mostly low in sodium.
- Liver is such a rich source of retinol that consumption of large amounts is not recommended in pregnancy

Histological structure of muscle tissue

- The muscles are surrounded by a connective tissue membrane, whose ends meet and merge into a tendon attached to the skeleton.
- Strands of fibers are grouped together in systems with connective tissue holding the system together.
- The connective tissue network is designed to combine and transmit the force of contraction to accomplish movement
- As a result, there is a complex network in muscle beginning with an exterior muscle cover termed the **epimysium.**
- A subdivision of the epimysium divides the muscle into **several** muscle bundles which are visible to the naked eye and the connective tissue around each bundle is referred to as the **perimysium.**
- Between the muscle bundles are blood vessels as well as connective tissue and fat deposits.
- Finally, within each bundle are several muscle fibers or muscle cells each surrounded by connective tissue called **endomysium**

The size and diameter of muscle fibers depends on

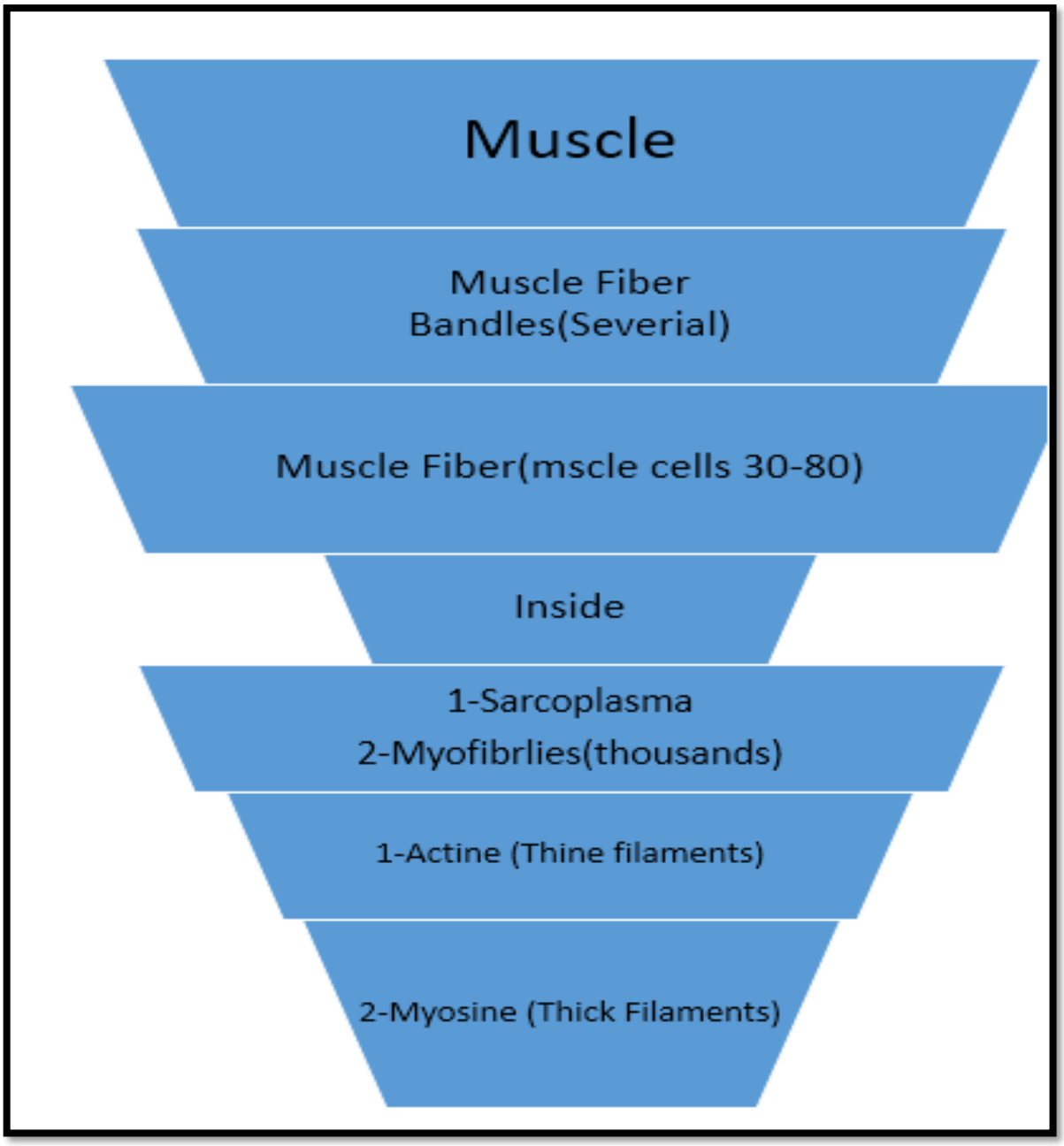
1. age,

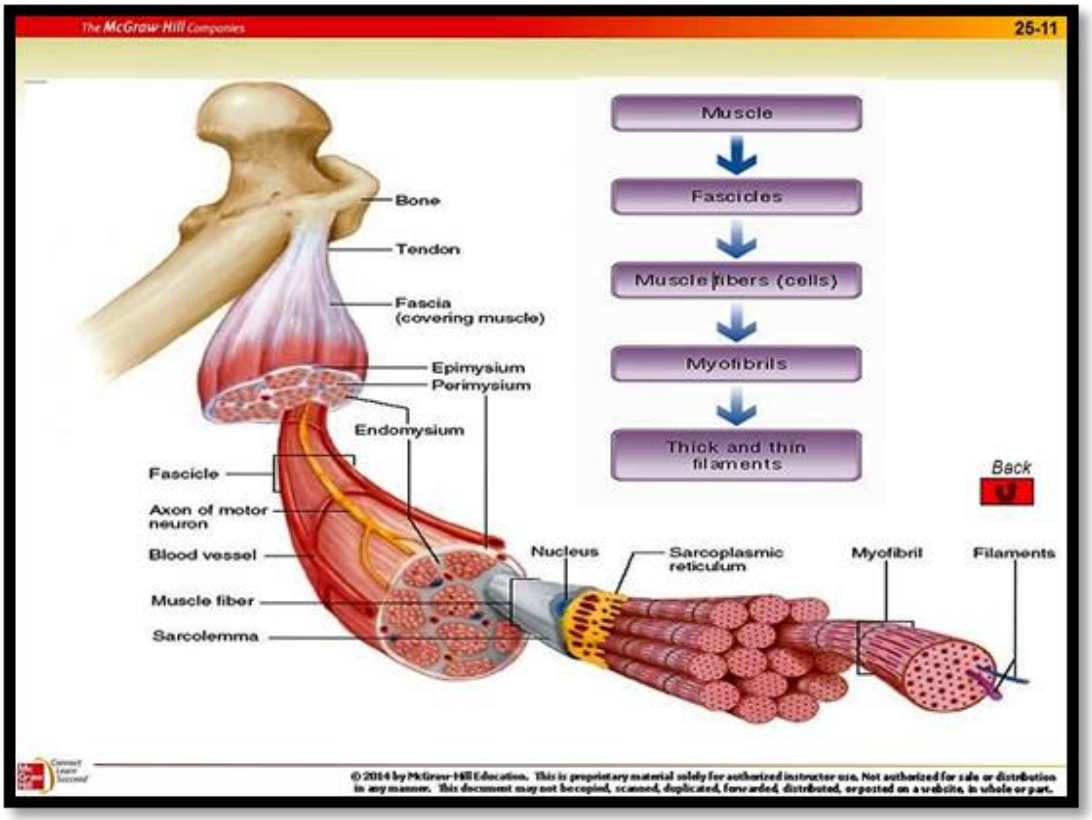
2. type

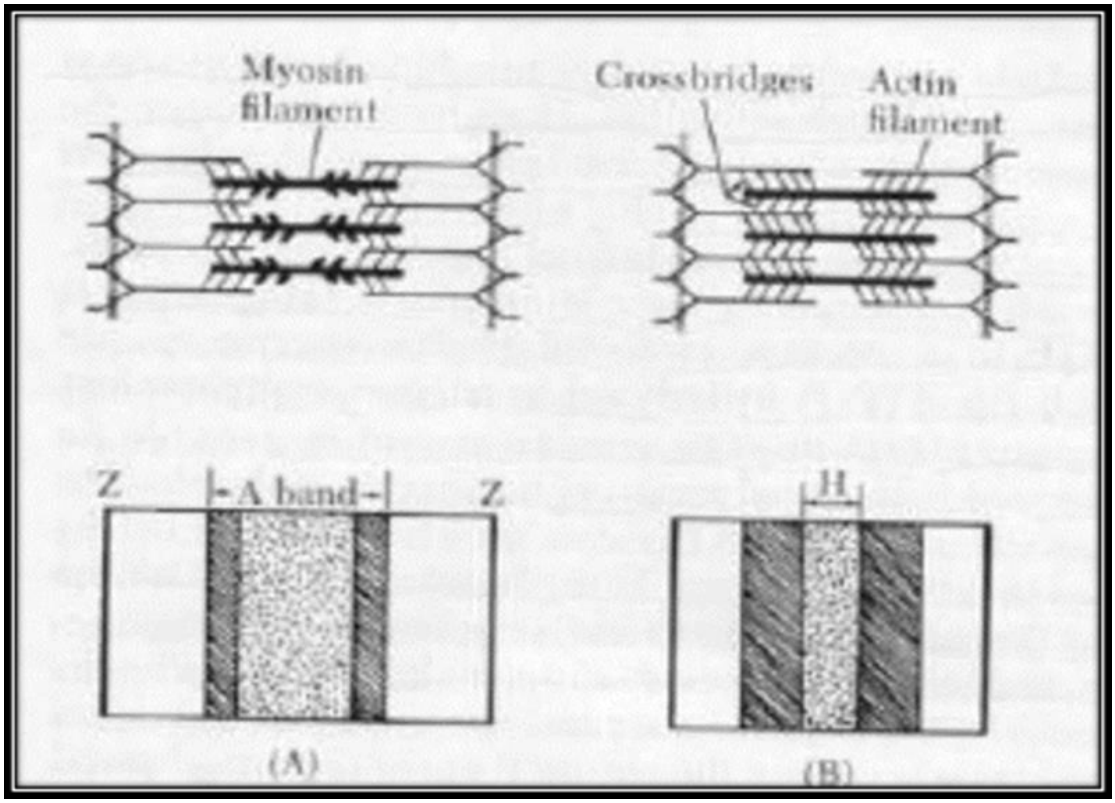
3. Breed of animals.

- Each muscle fiber (muscle cell) is surrounded by a cell membrane (sarcolemma).

- Inside the cell are sarcoplasma and a large number of filaments, also called **myofibrils.**
- The sarcoplasm is a soft protein structure and contains amongst others the red muscle pigment **myoglobin.**
- Myoglobin **absorbs oxygen** carried by the small blood vessels and serves as an oxygen reserve for contraction of the living muscle.
- **The sarcomere** is the unit of muscle structure between the two Z lines (Fig. 1).
- The sarcomere length changes depending on the contractile state of the muscle.
- The thick and thin filaments do not change length, but the degree of overlap between thick and thin filaments changes.


Muscle
Muscle Fiber
Bandles(Severial)
Muscle Fiber(mscle cells 30-80)
Inside
1-Sarcoplasma
2-Myofibrlies(thousands)
1-Actine (Thine filaments)
2-Myosine (Thick Filaments)





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