

Recognising meat and fat of different animal species

Introduction

Meat muscle is made of fibres and bound together with connective tissue, that are mainly linked to other groups of muscles or directly to the animal's bone structure. Muscle contains 60% to 70% moisture, 10% to 20% protein, 2% to 22% fat, and 1% ash, depending on type and species.

Methods to differentiate meat of animals

1. Differentiation between the carcasses of slaughtered animals.
2. Muscle characterisations includes:
Color, textures, presence of fat, muscle fibers and smell or odour of meat.
3. Fat characterisations includes: *Color, textures and quantity.*
4. Chemical methods.
5. Using laboratory methods include the Enzyme Linked-Immunosorbent Assay (ELISA) and Polymerase chain reaction (PCR).

1.Differentiation between the animal slaughtered

Feature	Sheep	Goats
Tail	large	small
Odour	rumen odour	steroid odour
Thigh	U shape	V shape
Subcutaneous tissues	not viscous	viscous with hair adherence

Muscle and fat characterisations: Cattle:

1. Pale red color with watery appearance.
2. The color of the beef has become darker and the structure and taste has also changed in the progression age.
3. Muscle fibers thick and have smooth texture.
4. Fat white to yellow (depend on age) with smooth texture.
5. Marbling (streak) Refers to the intramuscular fat that is evenly dispersed within the meat.

Beef meat:

1. The colour of beef varies from light red to dark according to the age and the carcass parts.
2. The meat usually is moist, silky to touch and is marbled with fat.
3. Fat is creamy white or yellowish white in colour.
4. In old cow the fat tends to be more yellow and somewhat loosen in consistency.
5. The veal is pale or greyish red in colour.



Buffalo:

1. Dark brown color meat with thick muscle fibers more than beef.
2. Fat has milky white color with rough and granular texture.



General Differences between cattle and buffalo meat:

- A. While the fat with the buffalo meat is milky white, fat in a cow or bull meat is yellowy white.
- B. Buffalo meat is darker in color than beef.
- C. Bones of buffalo are harder than cow.

Sheep meat:

1. Lamb is the meat of young sheep before they have 1 year.
2. Mutton is the meat of sheep, usually 24 months or older.
3. Lamb can vary in color from pink to pale red whereas mutton is slightly darker in color.
4. Muscle fibers thin or lean and smooth. Lamb has a finer texture than mutton. Fats accumulated in the tail.



Goats meat:

1. Goat males characterized by the odour like steroid which transfer from skin to carcass after slaughtering during dressing.
2. Color of meat light pink to bright red darker than mutton.
3. Goat meat is actually lower in calories, total fat, saturated fat, and cholesterol than not just lamb and beef meats, but also turkey and chicken meat.
4. Goat fat is viscous so we notice some hairs stick to their carcasses

**Horse meat**

- 1- The meat of the horse is dark red in color, on exposure to air acquires a bluish tinge or shield on the surface and later become dark.
- 2- Odour is peculiar-sweet and to most people more less repulsive, the horseflesh contains large quantity of glycogen (2%).
- 3- Fat is yellow or brownish yellow in colour, soft, greasy

**Pork meat**

The most desirable pork is greyish pink in colour, firm and fine-grained, well-marbled, and covered with an outer layer of firm white fat.

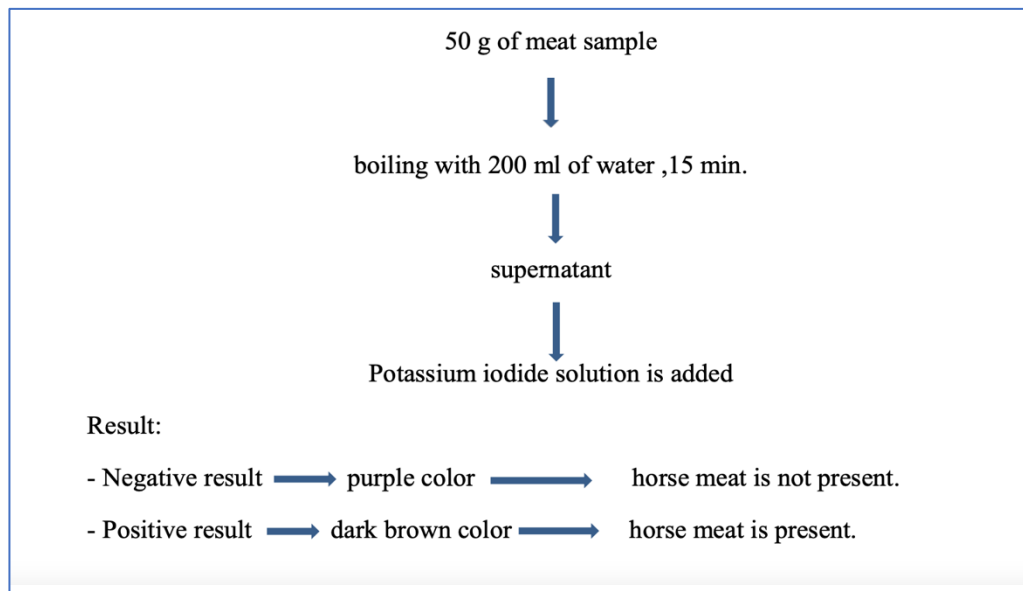


Dogs meat: Blackish red color.



Chemical methods

1-Measure glycogen value



2.Measure protein, water, fat, ash, and calories

Table 1: Content of water, protein, fat, ash (in percent) and calories
(approximate values for selected raw and processed food products)

	Product	Water	Protein	Fat	Ash	Calories / 100g
	Beef (lean)	75.0	22.3	1.8	1.2	116
	Beef carcass	54.7	16.5	28.0	0.8	323
F	Pork (lean)	75.1	22.8	1.2	1.0	112
R	Pork carcass	41.1	11.2	47.0	0.6	472
E	Veal (lean)	76.4	21.3	0.8	1.2	98
S	Chicken	75.0	22.8	0.9	1.2	105
H	Verison (deer)	75.7	21.4	1.3	1.2	103
	Beef fat (subcutaneous)	4.0	1.5	94.0	0.1	854
	Pork fat (back fat)	7.7	2.9	88.7	0.7	812
	Beef, lean, fried	58.4	30.4	9.2		213
	Pork, lean, fried	59.0	27.0	13.0		233
	Lamb, lean, fried	60.9	28.5	9.5		207
P	Veal, lean, fried	61.7	31.4	5.6		186
R	Raw-cooked sausage with coarse lean particles (ham sausage)	68.5	16.4	11.1		170
O	Raw-cooked sausage finely comminuted, no extender	57.4	13.3	22.8	3.7	277
C	Raw-cooked sausage					
E		63.0	14.0	19.8	0.3	240
S	(frankfurter type)					
S	Precooked-cooked sausage					
E		45.8	12.1	38.1		395
D	(liver sausage)					
	Liver pate	53.9	16.2	25.6	1.8	307
	Gelatinous meat mix (lean)	72.9	18.0	3.7		110
	Raw-fermented sausage (Salam)	33.9	24.8	37.5		444
	Milk (pasteurized)	87.6	3.2	3.5		63
	Egg (boiled)	74.6	12.1	11.2		158
	Bread (rye)	38.5	6.4	1.0		239
	Potatoes (cooked)	78.0	1.9	0.1		72

3-Measure Iodine vale in the meat of different animals

- Difference between Iodine values are given below:

Specie	Iodine value (%)
i. Horse	71-86
ii. Ox	38-46
iii. Sheep	35-46
iv. Pig	50-70