Meat, Offal and Poultry

Classification of meat
Carcass meat: e.g. pig (ham, bacon, pork), cow (beef, veal) and sheep (lamb, mutton).
Poultry: domestic birds reared for meat and eggs, e.g. chicken, turkey, duck and goose.
Game: wild birds and animals, e.g. pheasant, rabbit and deer (venison).
Offal: edible internal organs, e.g. kidneys, liver and tongue.

Structure of meat
• Meat fibres- actin, myosin and globulin; minerals, vitamins, water and extractives (substances, e.g. lactic acid, dissolved in water in meat fibres, improve the flavour and stimulate gastric juices, aids meat digestion).
• Connective tissue holds meat fibres together in bundles. Elastin and collagen.
• Fat in two forms:
- visible fat, found under the skin, adipose tissue or around internal organs, e.g. the rind on rashers
- invisible fat, present in the flesh as globules between meat fibres and the connective tissues, e.g. mince.

Average nutritional composition of meat
Carcass meat- B group
Offal- A, B group, C, D, K
Poultry- B group

Nutritional value of meat
<u>Carcass meat</u>
<u>Proteins</u>
• (HBV) protein
• Myosin, globulin and actin in the meat fibres, and elastin and collagen.
<u>Fat</u>
• Saturated fat
• Type of carcass meat, e.g. pork more fat than beef, and cut of meat, e.g. striploin steak has more fat than sirloin steak
• Visible or invisible
<u>Carbohydrates</u>
• Lacks carbohydrates, usually served with a carbohydrate-rich food, e.g. pasta
<u>Vitamins</u>
• Source of B-group vitamins
<u>Minerals</u>
• Haem iron
• Zinc, sulfur, potassium and phosphorus in small amounts ZSPP

Water
• Type of carcass meat
• Higher the water content, less fat present

Offal
Proteins
•HBV protein
Fat
• Low in saturated fat
Carbohydrates
• Lacks carbohydrates, small amounts of glycogen (stored glucose in liver). Usually served with a carbohydrate-rich food, eg
potatoes.
Vitamins
• B-group vitamins
• Vitamin C
• High content of vitamins A, D and K
Minerals
• Haem iron
• Zinc, potassium, phosphorus and sulfur, ZSPP
Water
• Type of offal
• Higher the water content, less fat present

Poultry
Proteins
• HBV protein
Fat
• Saturated fat
• Type of poultry, e.g. duck more fat than chicken, and the meat, e.g. leg meat more fat than breast meat.
Carbohydrates
• Lacks carbohydrates: usually served with a carbohydrate-rich food, e.g. rice
Vitamins
• B-group vitamins
Minerals
• Haem iron, less than red meat
• Zinc, phosphorus and calcium small amounts ZPC
Water
• Type of poultry
• Higher the water content, less fat present

Dietetic value of meat
• HBV protein that assists with growth and repair. Children, teenagers and pregnant women.
• Carcass meat is high in saturated fat, restricted in the diets of individuals with high cholesterol and those on calorie-controlled diets. Poultry is a good alternative.
• Meat is a good source of haem iron, reduce the risk of anaemia.
• Variety of types and forms, e.g. fresh and processed, to suit different tastes and add variety to the diet.

Causes of toughness in meat 2A's + 2I's
• Age: older animals have tougher meat than younger animals because:
- more connective tissue and their connective tissue is stronger
- muscle fibres are longer and thicker.
• Activity: active parts of the animal, e.g. the leg, is tougher, longer muscle fibres and more connective tissue over time.
• Incorrect treatment before and after slaughter: before slaughter, animals rested to enable glycogen build-up in their muscles, after slaughter glycogen converts to lactic acid, tenderising meat fibres during hanging. Failure will result in tough meat. Beef should be hung for 14-21 days and lamb for seven days
• Incorrect method of cooking: tough cuts of meat require slow, moist methods of cooking, e.g. stewing, collagen in connective tissue to gelatine, tenderises meat. If cooked quickly, e.g. grilled, meat will be tough and difficult to chew.

Methods of tenderising meat 4 M's
• Meat tenderisers proteolytic enzymes, e.g. papain from papayas, which break down meat fibres, are more digestible.
• Mechanical breakdown, e.g. pounding with a meat mallet, piercing with needles or mincing, breaks fibres into shorter lengths.
• Marinating acid (e.g. lemon juice), salt, herbs, spices and fruit or dairy breaks down fibres e.g. beef brisket.
• Slow, moist cooking methods, e.g. stewing, tenderise tough cuts of meat, as they convert collagen to gelatine, making meat fibres fall apart and become soft.

Guidelines for buying meat
• Retailer with a clean and hygienic meat counter. Should have a strict food hygiene and safety policy (i.e. HACCP) to ensure any meat being sold is safe and fit for consumption.
• Check the use-by date on pre-packaged meat. After this date meat may be unsafe to eat.
• Buy meat with the Bord Bia Quality Mark. This assures the consumer that best practices were implemented at all stages of meat production, reduces food safety risks.
• Ensure meat is the correct colour for its type, e.g. beef should be a dark red. The flesh should be firm and elastic.

Guidelines for storing meat

• Store meat in a fridge at 4°C, room temperature speeds up bacterial growth, increasing the rate of spoilage. If pre-packaged, leave in its original packaging and place on the bottom shelf of the fridge. If purchased loose, remove from the wrapper and place on a plate or in a container that will collect any juices. Cover to prevent from drying out, and place on the bottom shelf of the fridge.
• Minimise the amount of time meat is in storage. Use within two to three days.
• If freezing fresh meat, freeze at -25°C on the day of purchase.

Suitable methods for cooking meat

Roasting, e.g. leg of lamb
Barbecuing, e.g.fillet steak
Frying, e.g. bacon slices
Boiling, e.g joint of bacon
Grilling, e.g lamb chops
Stewing, e.g. beef stewing pieces
Microwaving, e.g. minute steak
Braising, e.g. beef round roast

Guidelines for cooking carcass meat

• Appropriate cooking method, e.g. frying or braising, suited to the type and cut of carcass meat.
• If baking or roasting carcass meat, ensure the oven is preheated, so it will cook meat until sufficiently high temperature, all pathogenic bacteria are killed.
• Avoid overcooking carcass meat, as it becomes tough and difficult to digest.

Guidelines for preparing and cooking poultry

• If poultry is frozen, thaw in a fridge at 4°C before cooking.
• Thoroughly wash hands and equipment used during the preparation of poultry to prevent cross-contamination and salmonella food poisoning. Never wash poultry.
• Cool leftovers quickly to avoid bacterial growth. Cover and store in the fridge and use within two days.

Effects of cooking on meat

• Protein coagulates at 40-50°C, causing meat to shrink.
• Colour changes from red to brown due to the denaturation of myoglobin (red pigment) to haematin (brown pigment).
• Collagen converts to gelatine, making meat more digestible as the fibres loosen and fall apart.

Meat processing

Freezing

Process

Meat, deboned and some fat removed. Be frozen by commercial methods, e.g. blast freezing at -30°C, or by home freezing at -25°C.

Effects

• No effect on colour, flavour and texture
• Freezer burn may occur if packaging is damaged
• Hydrolytic Rancidity of meat may occur if stored in the freezer for too long

Examples

• Pork • Beef • Lamb

Curing/salting

Process

Meat can be cured using two processes: wet curing and dry curing. Wet curing, injecting or soaking the meat in brine, made from water, salt (sodium chloride) and nitrates, rest for several days. Dry curing -traditional, coating the meat in plain crystal salt and letting it rest for a week or more. After each process, the meat may be smoked.

Effects

• Salt content is increased
• Colour and flavour are changed
• Microorganisms and enzymes are destroyed

Examples

• Bacon • Ham, e.g. prosciutto

Drying

Process

Meat has its moisture removed. Fluidised bed drying or accelerated freeze drying.

Effects

• Colour, flavour and texture are changed
• Loss of B-group vitamins
• Microorganisms and enzymes are destroyed

Examples

• Beef jerky • Meat in packet soups

Processed meat products

• Cooked sausages: e.g. black and white pudding and frankfurters. Made with raw meat, fat, water, fillers, flavourings, but some contain additional ingredients, e.g. oatmeal and pig's blood in black pudding.

• Beef burgers: minced beef, beef fat, wheat flour, water and seasoning, and moulded into a circular shape.

• Gelatine: colourless, tasteless and odourless setting agent made from the boiled bones, skins and tendons of animals. Thicken and stabilise desserts such as soufflés and cheesecakes.

Controlling meat quality in Ireland

The Department of Agriculture, Food and the Marine enforce food safety. They ensure that meat purchased is fresh, hygienic and free from disease by:

• monitoring the use of antibiotics and growth promoters in animal production

• testing animals routinely for diseases such as tuberculosis (TB) and bovine spongiform encephalopathy (BSE)

• ensuring the identification of livestock and traceability of meat.

Sustainable Beef and Lamb Assurance Scheme (SBLAS)

Bord Bia Quality Mark tells the consumer, quality assured, as they have been produced sustainably with the highest level of care and attention at primary production.

Farmer must be a certified member of the Sustainable Bord Bia Assurance Scheme

• High standards of animal welfare, e.g. animals are well-nourished, safe and comfortable

• Accurate records origin, sex, age, breed, movement and veterinary treatments of all animals to ensure meat is fully traceable

• implementation of a pest control programme in farmyards that minimises impact on the environment.