

fs FOOD SAFETY
WEEK
2023

Meat Quality



MEAT QUALITY

14th February



Available Android



Available iOS

translate

Carcass Quality

Meat Quality

Carcass Composition

Nutrient physiology parameters

EXAMPLES

- Protein Content
- Composition of fatty acids
- Mineral Content

Hygiene & toxicology parameters

EXAMPLES

- Microbiological status
- Pharmaceutical residues
- Heavy metal content

Processing parameters

EXAMPLES

- | | |
|---------------------|-----------------------------|
| • Shear force value | • Connective tissue content |
| • Blood spots | • Specific water content |
| • pH value | |
| • Drip loss | |
| • Fat content | |

Sensory parameters

EXAMPLES

- | | |
|-------------|-------------|
| • Texture | • Taste |
| • Colour | • Marbling |
| • Juiciness | • Structure |
| • Odour | |



Why is high quality meat important?

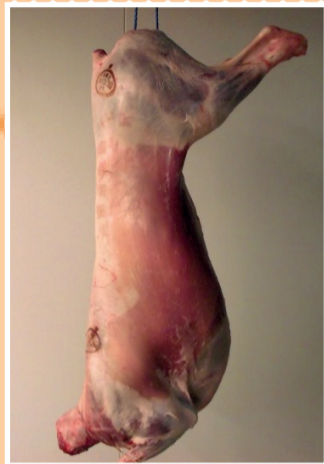
It ensures that consumers consistently receive meat that is:

Tender

Juicy

Flavoursome

Visually Appealing



1 Maturation

Meat tenderness increases in extended storage as naturally occurring enzymes break down protein in the meat. Maturation can occur in hung carcasses, unpackaged primal or vacuum-packed meat leading to improved tenderness and a change in flavour.

3 Electrical Stimulation

The rate at which pH falls early in post mortem influences its ageing response. Fast falling pH muscles are more tender. Muscles are stimulated to contract and use up energy quickly creating the lactic acid which accelerates the onset of rigor mortis and allows earlier chilling. A high voltage applied prior to chilling increases tenderness.

2 Chilling Rate

Meat toughness may increase if muscles contract before rigor mortis sets in. Cooling too fast, or too soon, results in muscle 'shortening'. As a general rule, while chilling the carcass, avoid a muscle temperature $<10^{\circ}\text{C}$ for 10 hours after slaughter. If electrical stimulation has been used, faster chilling is preferable.

4 Hip Suspension

Suspending a beef carcass from the hip, rather than Achilles heel, stretches muscles and avoids contractions before rigor mortis, which may lead to increased tenderness in the leg and loin muscles.



MEAT QUALITY AND

Glycogen

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1

Cattle and sheep store energy in muscles as glycogen



2

Glycogen converted to lactic acid after animal dies – pH starts to drop. This is an essential step to produce good quality meat



3

The amount of pH drop determined by the amount of muscle glycogen store prior to slaughter



4

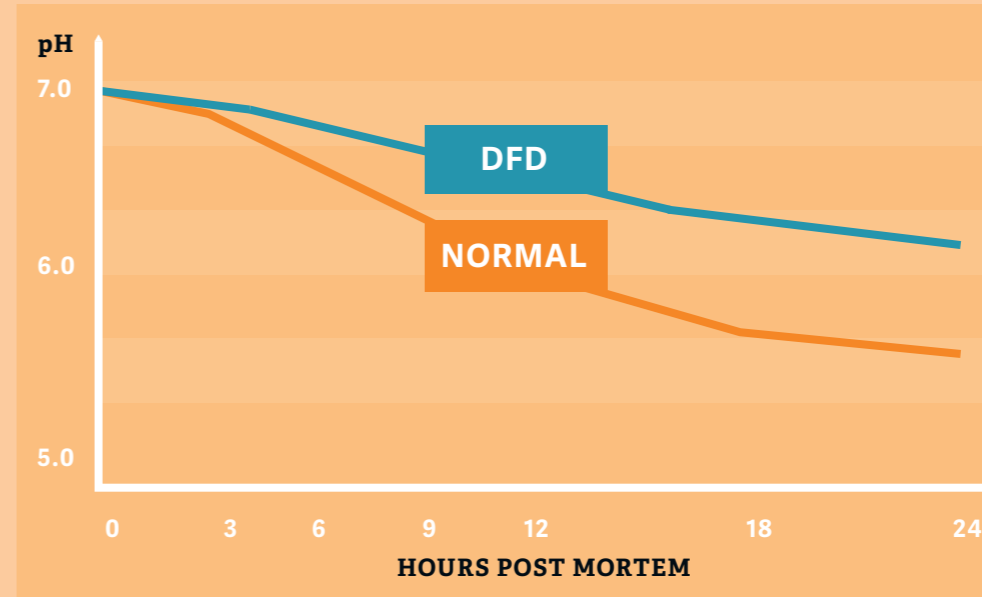
Stress before slaughter = less glycogen stored in muscle due to fight or flight reaction = less pH drop



5

If muscle glycogen store is depleted, this can lead to lower quality meat – optimum pH is 5.4–5.7 at 24 hours post slaughter

pH DECLINE DURING 24 HOUR POSTMORTEM FOR CARCASSES



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MEAT QUALITY



Stress

*Optimum pH for meat
24 hours post slaughter
5.4- 5.7*

Animal has not experienced stress prior to slaughter.

High Quality Meat

- Bright red colour
- Tender
- Firm
- No off odours – microbially stable



If an animal experiences chronic stress 24-48 hours prior to slaughter, the pH does not fall to optimum level

A high pH will cause the meat to be dark, firm and dry (DFD).

DFD

- Dry sticky texture
- Dark undesirable colour
- Short shelf life – prone to microbial growth



How to prevent stress in animals?

All staff must have animal welfare training

Careful handling

Quiet, calm environment

Keep animals in social groups



Carcases are pH tested and visually inspected to detect DFD meat