



May (Autumn) 2010, 2 pages

## ACCELERATED CONDITIONING OR EFFECTIVE ELECTRICAL STIMULATION

*The following information has been reproduced (with minor alterations) from The Venison Feedback Workshop – Participant Notes. Technical Document No. – VFW.MAN 1.94. Pp 11, 12, 13. It was a workshop run by Ausmeat and funded by RIRDC.*

*It has been reproduced with the kind permission of Cecile Ferguson, Publications Manager, Rural Industries Research and Development Corporation.*

Accelerated Conditioning (AC) and/or Effective Electrical Stimulation (EES) accelerate the starting of Rigor Mortis and reduce the incidence of cold shortening.

### Effective Electrical Stimulation

- Is the passage of an electric current through a carcass causing violent muscle contractions to occur?
- Dramatically reduces the incidence of heat ring due to the accelerated rate of pH decline and increased speed of Rigor onset.

### Provided It's Effective, EES Results in:

- Accelerated anaerobic glycolysis
- Rapid drop in muscle pH
- Onset of 'conditioning' whilst the carcass is warm
- Accelerated Rigor Mortis process
- Reduced incidence of cold shortening
- Reduced time required for full conditioning because conditioning can begin sooner
- Reduced amount of 'drip' from meat cuts

### Cold Shortening

Toughening in some cuts can occur if the Rigor Mortis process is delayed because the carcass has been chilled to too low a temperature. This is because:

- Rapid chilling actually slows Rigor Mortis which causes the meat from the cuts near the surface to 'cold toughen' and be tough
- Some cuts from fatter, larger carcasses that cool more slowly, will be more tender due to reduced cold shortening
- Effective Electrical Stimulation will reduce the possibility of Cold Shortening developing
- Effective Electrical Stimulation will produce a more uniform product with regard to tenderness

### Conversion of Muscle to Meat

- This is the process of Rigor Mortis, which means the "stiffening after death" that commences soon after the animal is slaughtered.
- It is a complicated process that results in the energy stored in the muscle, called glycogen, being converted to lactic acid in a process called glycolysis.
- The amount of lactic acid produced depends on the amount of glycogen present. Lactic acid production causes the pH of meat to drop to about 5.4.
- Conditioning is a complex process that results in the living muscle of the freshly killed carcass being converted to meat, that is, edible muscle.

### CONDITIONING OF MEAT

This is a term used when muscle is converted to edible meat. The following two examples describe in steps the natural process of muscle enzymes breaking down muscle into edible meat.

### Summary of Conditioning Process

**A**

**1. LIVING MUSCLE CELL**

pH about 7.1 – 7.4 proteolytic enzymes are INACTIVE

**2. ESS**

pH drops to below 5.5. Proteolytic enzymes become ACTIVE and start to break down muscle proteins and collagen – this is the start of conditioning.

**3. ONSET OF RIGOR MORTIS: CARCASS STIFFENS**

**4. CHILLING**

**5. CARCASS BECOMES FLACCID**

This is the resolution or end of RIGOR MORTIS

**6. TENDER EDIBLE MEAT**

“Conditioning” can continue for several weeks under controlled temperature conditions to get maximum benefit.

**B**

