

MODULE 3: UNIT #1

Conversion of Animals to Meat: The Harvesting of Muscle from Animals

These two upcoming sections [6.3 and 6.4] have been written to explain to you how the live animal is transformed from being on the hoof [alive] to meat suitable for human consumption. This would then lead us logically to Peccary Cuisine.

Conversion of Animals' Muscle to Meat: The Harvesting of Muscle from Animals

This section attempts to simplify for you the process of converting animal muscles and edible parts into safe and wholesome edible animal products. It should be pointed out here that the unique features of the many Neo-tropical meats are still to be understood. The harvesting of muscle from live animals requires that the animals must first be certified to be of good health, then the animals' lives must be terminated and finally the meat and other animal products removed from the lifeless animal. Finally, the animal products so harvested must then be certified safe for human consumption. This set of activities can be simplified as follows:

Ante Mortem [AM] Inspection

This is the inspection of the animal 24 hours before slaughter (before the animal is humanely put to death). First there is the external physical examination, the taking of the rectal temperature (to ensure that the animal is in a normal state of health) and the physical examination of the animal to ensure that the animal does not display any obvious signs of disease.

Animal Slaughter

Next in the process flow is animal slaughter. It is the steps involved in taking the animals' life and safely collecting the products from its lifeless body.

Before slaughter, however, the animal must be fasted/or not fed for 24 hours.

A very important feature of this process is the live animal entering at one end of the facility to the kill floor, and its parts [containing the parts of the digestive system] coming out in one direction and the edible meat and organs in the opposite direction. This ensures that the edible meat and organs are not contaminated by the faeces or contents of the digestive system.

Post Mortem [PM] Inspection

This involves the inspection of

- the Animal's Head and Glands around the neck region;

- the Liver
- Kidneys
- Heart and
- The general condition of the carcass.

Figure 154 presents the process flow chart for the general harvesting of muscle from different kinds of animals.

The Conversion of Muscle to Meat

The muscle on the animal at slaughter is a living tissue with complex biochemical and physiological properties. We impose a series of treatments, changing its temperature, tension, and fluid and gaseous environment, and it changes from muscle to meat.

Living muscle tissue

In living muscle, the complete oxidation of carbohydrate to carbon dioxide and water requires the intervention of oxygen, and it releases a lot of energy. Much of this energy is captured by adding a phosphate group to another molecule that already contains two phosphate groups. This chemical in the muscle tissue is called adenosine diphosphate (ADP) and it is converted to adenosine triphosphate (ATP). The ATP molecule carries this energy within the muscle fibre, and it may be released to another biochemical system by cleaving off the added phosphate ($ATP \rightarrow ADP + P$). Muscle contraction is a primary user of ATP in the living animal, but substantial amounts of ATP are also used by the membranes around and within the fibre for maintaining ionic concentration gradients.

The muscle tissue after exsanguinations [bleeding]

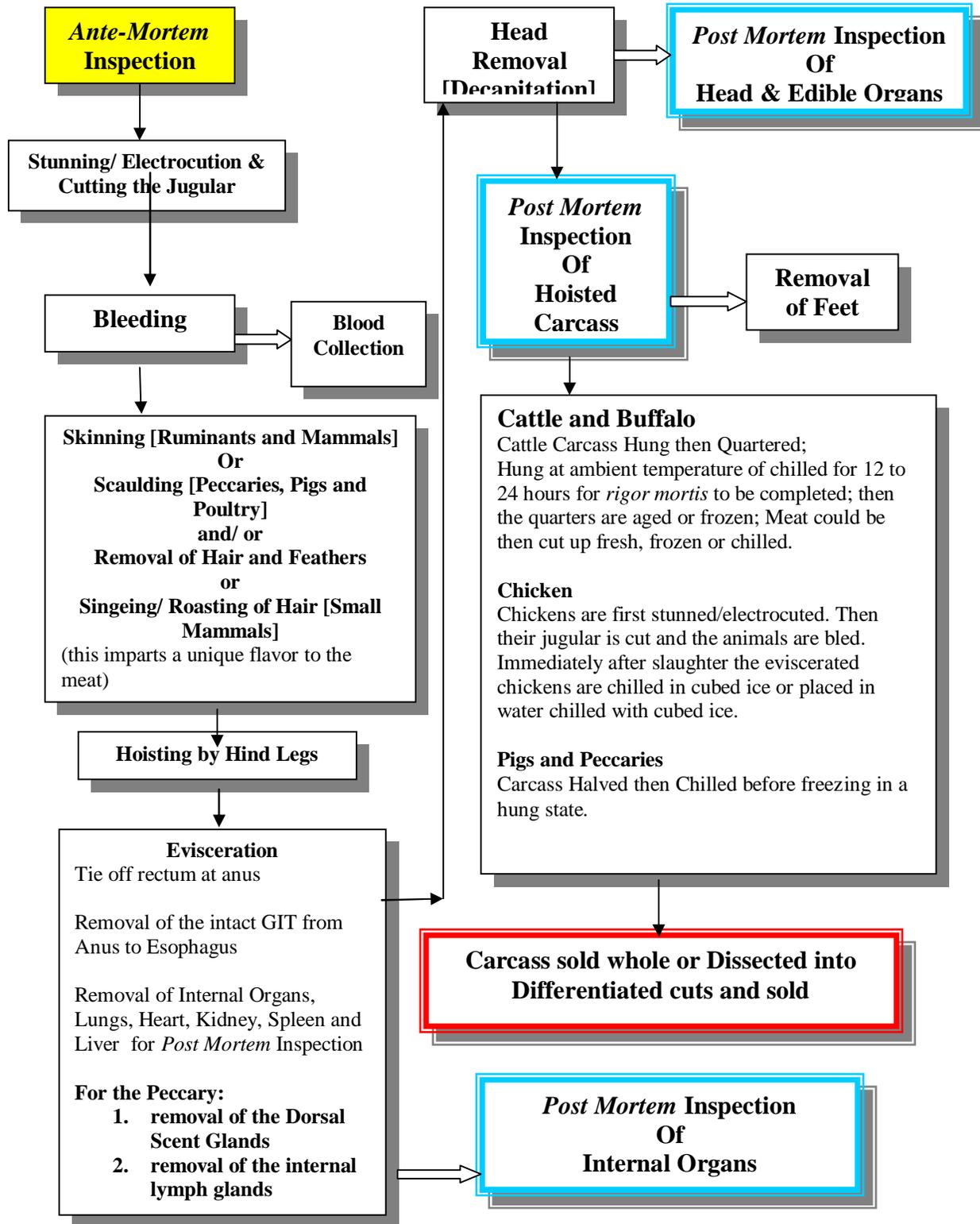
Once the animal has been exsanguinated, the oxygen present within the muscles is rapidly used up effectively starting the process of converting muscle to meat.

Rigor Mortis

Rigor mortis is a Latin word which means “stiffness to death”. This is the changes in the contraction and relaxation of the muscles of animals that occur after death at ambient temperature. It is simply stated as the temporary stiffening of a body after death. It can also be referred to as the state a body reaches when the oxygen supply to the muscles ceases by the cells but continue to respire without oxygen.

In the literature there is no information on the changes that takes place in the muscles of the Peccary after death. We know that rigor mortis affects meat cooking and eating quality in ruminants, and less so in pigs, therefore it may be that the peccary is somewhat in between.

The Harvesting of Muscle from Animals
 [Source: Gary Garcia (unpublished)]



Aging

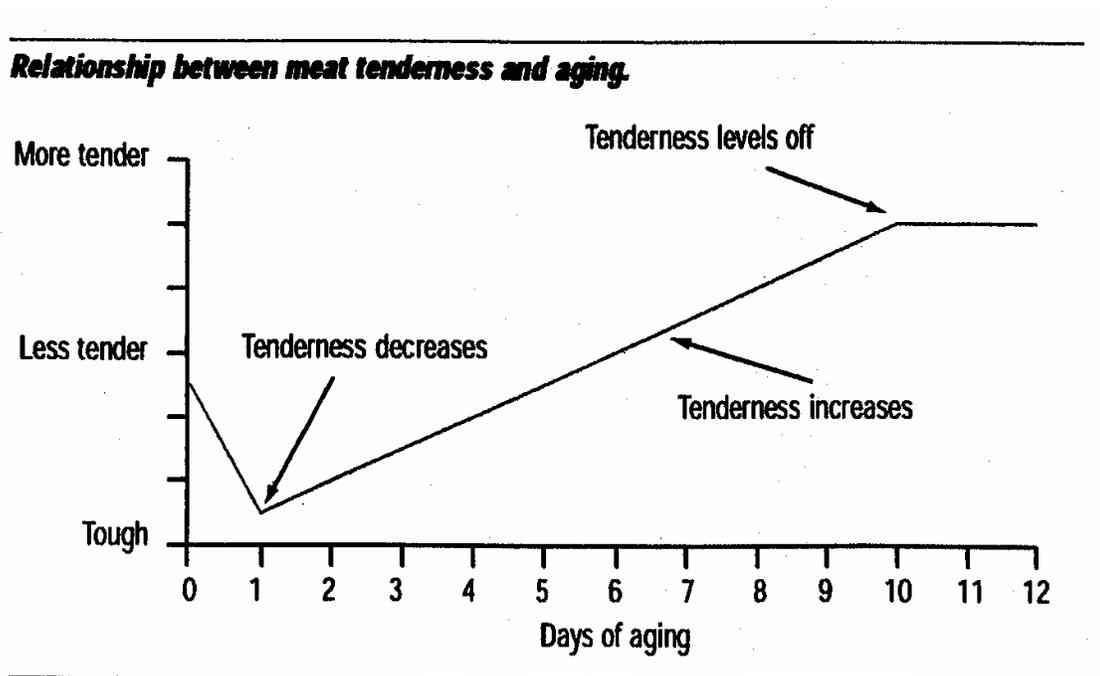


Figure 1: Relationship between meat tenderness and Aging

Source: Processing of Wild Game and Fish; College of Agricultural Sciences, Penn State University, USA.

Aging of meat is also known as **seasoning**, **ripening** or **conditioning**. This is the practice of holding carcasses or cuts under low controlled temperature and humidity for several days to enhance flavor, to tenderize them and to complete the curing reactions. Game meat or wild meat is aged to tenderize the meat, this occurs when enzymes breakdown or degrade complex proteins in the muscles of the dead animals over time. Figure 155 above presents this relationship. The meat has to be held cooled at between 1 to 5 °C. Peccary meat could possibly be aged with the skin on it but the Dorsal Scent Gland must be removed. This is an area of immediately needed research for the Peccary.

Mc Andrew (1993) in his book on the cooking of "Poultry and Game" has suggested the following hanging times for different European Wild animals:

- § Rabbits: 2-3 days
- § Hares: 4-5 days
- § Venison/Deer: 7-12 days.

This type of information is still to be determined, however, for the meats of our neotropical wildlife species.