



**Lecture title: Meat Hygiene: Introduction of meats**

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**Summary:**

**What is the meaning of the meat ?**

**Meat** is defined as those animal tissues ,which are suitable for use as food .All processed or manufactured products that might be prepared from these tissues are included in this definition

**Meat** can be subdivided into several categories , the largest category is **red meat** which include beef ,pork, mutton ,veal However ,goat ,buffalo , camel and rabbit are commonly used for human consumption

**Poultry meat** is the flesh of domestic birds and includes chickens,turkeys, geese and pigeons

**Sea food** is the flesh of aquatic organisms of which the bulk is fish,however ,the flesh of clam , lobsters ,oysters ,crab and many other species are also included in this category.

The fourth category is that of **game meat** which consist of flesh of all non-domesticated animals  
Meat is one of the most nutritious foods used for human consumption , itis an excellent source of high quality protein ,and also contain large amount of mineral and B vitamins .It has been postulated that if the people of the underdeveloped nations of theworld could be adequately supplied with meat or other high quality protein food ,their capability for rapid industrial , political and intellectual development would increase many times. Meat has long been regarded as a highly nutritious and highly desirable food, it is not only highly susceptible to spoilage ,but also frequently implicated in spreading of food – borne disease .Consequently knowledge's of the microbiology of meat is of important in the development of methods which are satisfactory to prevent as retard the spoilage of this most valuable nourishment food articles, In addition to protection of consumers against food – borne microbial , viral , parasitic and fungal disease by proper meat inspection services which consists of a veterinary examination of carcasses and offal's and where necessary laboratory tests of body tissue and fluids .Meat hygiene is not limited to study of tissues , it includes all facts of the meat industry , beginning with animal production and ending with final preparation for consumption . Breeding , feeding and management are extremely important parts of the food chain , because quality control actually starts on the farm .



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### **Food animals**

Slaughter animals means any animals brought into an abattoir for slaughter. Meat is normally regarded as the edible parts (muscles and of fats ) of food animals which consume mainly grass and other agricultural crops as cattle , buffaloes , camels , horses , sheep , goats and pigs .

In addition, poultry (chicken ,ducks, geese, turkeys and pigeons ) have become a major meat – producing species , while rabbits , various game animals and birds provide a significant amount of protein . Although , theoretically , human needs animals for supplying meat fit for human consumption , in practice only a relatively small number of species are used today . In many parts in the world , horse flesh forms an important article of human diet ; slaughter of horses for human consumption is now well established in Denmark , Belgium , Holland , England and Germany .

Nowadays , the production and consumption of the poultry meat and rabbits has extremely increased **after the recent improvement in feed conversion rate** and their quick turnover Rabbits form subsidiary, but important source of meat because of their quick turnover and feed conversation rate of 2 : 1 .

A great advantage of rabbit as meat producer is its high muscle / bone ration due to 70 % of the carcasses is composed of edible meat as compared with about 50 % in the chicken .

**The future demand for meat** and products will depend mainly on several factors such as:

- cost of production
- feed conversion efficiency
- land use and availability
- consumer taste
- price to consumer
- diet
- attitude of people to meat production methods
- use of protein from non – animal source

### **transportation of animals?**

The transformation process of slaughter animals into meat is a chain of events including handling and loading on the farm, transport to the slaughterhouse, off-loading and holding and finally slaughter. The Canadian Food Inspection Agency (CFIA), with the help of other federal, provincial



and territorial authorities, enforces the requirements for the transport of animals into, within, and leaving Canada. Provincial/Territorial governments have the regulatory authority over the During these procedures poor operational techniques and facilities will on-farm care and treatment of animals in Canada. The federal government is responsible for regulating the humane lead to unnecessary suffering, injury and loss of production. transport of animals under Part XII - Transportation of Animals of the *Health of Animals Regulations* which defines the conditions for humanely transporting all animals in Canada by all modes of transport.

The regulations prohibit the:

There are many advantages to improving conditions for livestock destined for slaughter. These will have the benefit of improvements in overcrowding of animals; transporting of animals that are unfit for transport; loading, transporting or unloading of animals in a way that could productivity, animal welfare and personnel safety. Improving animal cause injury or suffering.

welfare is necessary to reduce suffering, Better conditions of livestock The regulations also establish the requirements for:

- operations will also improve safety of workers in the livestock and meat
- providing food, water, and rest at specific intervals
- protecting animals from adverse weather; industry.
- providing adequate ventilation
- using proper containers and transport vehicles
- segregating incompatible animals.

Officials of the CFIA monitor compliance with the regulations by:

conducting routine inspection at strategic locations, such as at the production is increased through humane treatment of slaughter points of entry to Canada, and at registered establishments, auction markets, assembly yards and roadside blitzes; and animals and can be achieved, for example, through:

following up on reports of non-compliance.

- 1· reduced carcass damage by less bruising and injury.
- 2· decreased mortality.
- 3· improved quality of meat by reducing animal stress.
- 4· increased quality and value of hides and skins.



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## **Transportation of Animals**

Indication :

- Exhibition.
- Marketing.
- Changing the place of farm. -Carrying to abattoirs.

The aim of transportation should be done for all animals to reach their place in good conditions and in short time as possible . The first requirement to be made for animals to transport is :

- 1-Fit and strong .
- 2-Healthy and free from infectious and contagious diseases.

Animals may be moved from farm to abattoir on hoof or by lorry ,rail ,ship or other means. The moving of animals by any of these means will affect their physical condition and subject them to factors ,which may have a harmful effect on meat quality , Its essential that livestock be slaughtered as , near as possible to the point of production in order to avoid long journey and hazards which may arise.

To ensure that the transport of animals shall be such as to reduce the risk of injury and unnecessary suffering during the journey ; the following meaning applied :

- 1- good Hygienic and nutrition of animals.
- 2- Climate (to avoid sunstroke and chilling)
  - a- in winter – in sunlight.
  - b- in summer – in early morning or after sunset.
- 3- Avoid transport of :
  - pregnant females
  - very old and fat
  - sick animals
- 4- Animals of significant difference in weight , age must not be carried in the same undivided vehicle , the same with different species of food animals
- 5- Loading and off-loading must be carried out in such a way that animals are not caused injury or unnecessary suffering ,animals should handle gently .Loading must be carried out using vehicle.
- 6-The vehicle should be well ventilated ,its essential that during transit animals .



7-No animals shall be carried on a vehicle unless it is accompanied by attendant responsible for the care of the animals.

8-In long journey ,Adequate and suitable food and water must be offered to the animals at least every 12 hours during the journey.

9-Unfit animals are not permitted to travel .

10-Carcasses must not be carried in vehicles in which a live animal is being carried.

11-The interior of the vehicle washed & scrubbed with water . An approved disinfectant must be carried out as soon as after unloading .

Affection induced by transportation

1-Fractures ,bruising ,much of trauma ,stress and other injuries may be induced during transport.

2-Suffocation is another risk ,which particularly likely to occur in food animals when they are given a heavy meal before being transported under the mistaken impression that it will increase the market weight and offset the loss of weight during transport.

3-Transport of animals may give rise to symptoms that may be taken as signs of disease . The transported animals may even show signs of fever ,which disappears after several hours rest .

4-loss of weight –all animals transported to slaughter will suffer some loss of live weight during journey .The factors affecting this loss are the state of weather ,the condition of the animal before transport and journey .At least a decrease of 1-2 % or even more of the live weight of the animal may be expected.(9 Kg in calves)

5-Transport mortality – deaths in all cases of livestock occur during transportation .The incidence may be less than 1 % or more according the circumstances ,which involve the journey.

6-Laminitis from long standing .

7-Transit tetany (occur in cow and ewe specially in heavily pregnant animals ).

8-Transit fever-shipping fever( pasteurellosis)





## Cornell University Institutional Animal Care and Use Committee

### Transportation of Animals

The intent of this policy is to describe the procedure for transporting animals covered by IACUC protocols both on and off campus.

#### CONTENTS

1. Policy
2. Procedure
3. Regulatory Guidance

#### 1. Policy

- a. Transporting animals outside an animal facility must be described in the IACUC-approved animal use protocol.
- b. Vehicles appropriate for animal transport must be used.
- c. Public transportation (e.g. shuttle buses, intercampus buses, trains), and the use of bicycles, motorcycles, motor scooters are not acceptable or permitted.
- d. Transportation between animal facilities requires the approval of the facility managers and PI (s).
- e. This policy does not apply to transportation of privately owned animals, or animals being treated in a veterinary-client-patient relationship.
- f. Any exceptions to this policy must be pre-approved by the IACUC or by CARE.

#### 2. Procedure

- a. Follow Animal Care & Use (ACU) 547: Transport of non-agricultural animals.
- b. Follow ACU 532: Cleaning and Sanitizing Department Vehicles
- c. Follow Facility-specific SOPs and applicable local, state, and federal regulations for transportation of Agricultural animals.
- d. Contact CARE with details specific to your animal transportation request.

#### 3. Regulatory Guidelines

Relevant excerpts from the Guide for the Care and Use of Animals 8<sup>th</sup> Edition (the *Guide*):

- a. *Animal transportation may be intrainstitutional, interinstitutional or between a commercial or non-commercial source and a research facility. For wildlife, transportation may occur between the capture site and field holding facilities. Careful planning for all types of transportation should occur to ensure animal safety and well-being. The process of transportation should provide an appropriate level of animal biosecurity while minimizing zoonotic risks, protecting against environmental extremes, avoiding overcrowding, providing for animal physical, physiologic or behavioral needs and comfort, and protecting the animals and personnel from physical trauma.*
- b. *Movement of animals within or between sites or institutions should be planned and coordinated by responsible and well-trained persons at the sending and receiving sites to mi-*