

POULTRY MEAT HYGIENE

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Nutritive value of poultry meat:

- good source of both saturated and unsaturated fatty acids including certain essential fatty acids.
- Its protein content is higher in comparison to other types of red meat.
- The cooking of meat makes it tender and easy to chew and allows the digestive juices to have a better access to the protein..

The. calories content of

- broiler meat is around 160 cal/ 100 gms
- roasters meat is around 198 cal/100gms
- Hens meat is around 300 cal /100gms
- duck meat is around 1 85 cal /100 gms
- turkey meat is around 1 75 cal/100 gms

*Different compartment of
poultry dressing plant.*

1- Receiving plat — form:

- for reception of alive poultry
- performance of ante — mortem inspection.

2- Slaughtering line:

After shackle suspension poultry are slaughtered.

3- Bleeding:

slaughtered birds are allowed to bleed for 3 min through bleeding trough or channels in order to minimize aerial contamination during straggling of birds.

4- Scalding:

-bled poutry are allowed to pass through scalding tank which filled by continous stream of hot water (56 - 60°C)for 3-5mm.

5- Plucking:

6- Preparation:

- done either mechanically or manually.
- After plucking the moved carcasses are forced to pass through a fixed knife in order to separate the legs.
- Resuspension of the dressed poultry carcasses into the production line.
- The suspended birds are subjected to evisceration by a single colocal opening i.e. incision above the cloaca by 2 fingers.
- Care should be taken to avoid contamination.
- Drawing i.e. drawing back of the viscera including liver & gizzard “giblet”
- P.M. inspection should be done during this step.
- Removal of the neck: the neck is **1st** incised by a bone saw then forced to pass through a fixed metal knife to separate neck but not skin flap.
- After preparation, carcasses should be pressurized water spray

7- Washing & Cooling:

- washing either tank or spray washing, cooling either dry cooling or tank cooling
- Dressed poultry are then forced to pass through tanks containing tap water & slush ice to give a final temp. dressed poultry should be remain inside the tanks until muscle temp reach **+5 c.**
 - water retention may reach 10 % of carcass weight.

8- dripping = Dryig process

washed & cooled carcasses are then allowed to move in a chain for about 5 mm. in order to allow the lossely heat remain H2O to break down.

9- sorting and packaging

the dressed poultry are sorted according to their weight then packaged in polyethylene package

10- Grading:

grading of the dressed poultry into (A,B, C) qualities according to body confirmation, distribution of body fat & degree of freedom from any defect.

11- Storage

12- Dispatching Plat form:

- should be faraway from receiving plat —form.

-

13- By-product — unite:

- for processing bone, meat & blood-meals.

Ante Mortem Inspection of Poultry

PURPOSE

- 1-To prevent diseased birds being allowed into the plant.
- 2-To prevent dead birds being allowed for consumption.
- 3-Decide the suitable time for suspected birds.
- 4-To prevent Zoonoses, (ornithosis, psittacosis)

Site:

1-At the farm

- records of growth rate
- food consumption record.
- Number of death.
- Results of laboratory test.
- Salmonella screening
- Inspection of birds.

Decisions of A.M.I

birds go to the plant.

Leave to recover.

Unfit for slaughter

2- In the plant:

- To detect birds dead during transportation.
- To detect signs of emaciation or damage.

- A.M.I. Point

In the lorry

During shackle suspension.

Before stunning.

Result of A.M.I.

- **1-unfit for slaughtering for human consumption,** due to:
 - a- birds in moribund state or
 - b-birds diseased with curable disease which might respond to treatment.
- 2- **Suspect** i.e. requires special P.M. I.
- 3- **Birds affected by localized disease** i.e. fit for slaughtering for human consumption. After local cond.
- 4- **Normal birds** i.e. fit for slaughtering for human consumption.

POST-MORTEM- Inspection OF POULTRY

- A. **Whole carcass inspection** After plucking & Washing inspection check the whole carcass
- Early recognition of plucking faults
 - Early recognition of the advanced case of the disease

B-Partially eviscerated carcasse during evisceration

The internal organs should be inspected

- **R.H.Trigt hand technique**

- 1- thigh inspection

- 2- Internal surface

- 3-External surface

- 4- Head & neck

- **L.H.Tleft hand techniquit**

- 1- spleen

- 2- Liver, heart

- 3- Gizzard

- 4- Intestine.

- In hens: The ovary is better to be separated from the carcasses & hang in the metal cups attached to the carcass.

Inspection facilities:

- Light, hand washing facilities, shower's, sterilizer, line stop switch and recording sheet.
- Inspection space 1 -2 meter
- Inspection rate 3.5 sec./bird.

System of inspection

1-One line system—Production power 10000 bird/day need one P.M. station, Inspect one bird/3 bird

2-More than one line in plant production more than 10000 bird/day, to facilitate P.M inspection.

PROCESSING FAULTS OF DRESSED BROILER'S

1- *Missing of viscera:*

It is more common in automatic evisceration processing.

- **Judgement** : depend on antemortem inspection and which organ is missing

a- If only the intestine is present and the rest of viscera are missing & the history of later inspection is unsatisfactory (total condemnation)

b-If the heart or spleen or intestine or liver is missing **but** the remaining organs are healthy (approved).

2-Broken bones and haemorrhages:

- **Judgment:**

- a- If in the legs — removed at the nearest joint.

- b- Intramuscular haemorrhages —Trimming of muscles with haemorrhages.

3 Contamination

- cause

bile contents (bitter taste & fecal odour)

gastrointestinal content (Food poisoning)

-Judgment:

a- bile content (partial) Trimming of the affected part.

b- G.I.Tcontent (partial) condemn edible viscera and the affect part

All Carcass contaminated total condemnation.

4- *Dead carcasses.*

cause :

loading problem (detected at A.M.I.)

Technical defect.

On p.M.

Whole carcasse inspection, picture of ill bleeding (M. dark, bl.v. engorged with bi., carcass dehydrate)

• **Judgement :**

Total condemnation

5-Over scalding:

- **cause :**

temp. high (more than 60°C)
scalding time longer (more than 5mm)

-*P.M.*

a- **Whole carcass inspection.**

Skin easily masorated, yellow discolouration
carcass appear cooked & muscle Under the skin
appear pale
colour.

b-**Partially eviscerated carcass.**

The muscle only boiled or muscle and Viscera
are boiled

- Judgement

you have to correct the technical fault in order to save the rest of bird.

a- If only the superficial surface of the muscle are boiled
approved with low price

b-If cooking extend to deeper tissue & reach abdominal
viscera —total condemnation (by- Product unite)

6- Pin -feather

Cause

temp low (less than 56°C)

Scalding time shorter (less than 3min.)

- Judgment

approved (low price)

**pathological conditions of importance
in P.M. I. Of dressed poultry**

1- *Septicemia*

On P.M. (whole carcass inspection) may be.•

- Carcass appear congested and darker than normal
- Cuteness bl.vs. clearly visible.
- may be anaemic
- may be cyanoses & dehydration

On PM (partially eviscerated carcass)

- Internal organs congested & engorged with blood
- Finding of degenerative changes.
- Picture of peticheal haemorrhages on the internal organs particularly on the coronary fat.
- May be specific lesion due to specific diseases.

Judgment

total condemnation

2- *Breast blisters*

common in case of infections
synovitis and affect anterior ventral
part of sternum which may extend
posteriorly to about 5 cm.

Judgment:

Trimming.

3- Emaciation

- May be accompanied either chronic or acute disease
- **Chronic conditions** such as coccidiosis, intestinal worms, Chronic air sacculitis , T.B.
- **Acute conditions** in which the bird may be suffer from an acute disease and then partial recovery but remain emaciated. so upon P.M. it is impossible to detect the original cause of emaciation

- On P.M.
- Regression of body tissue.
- Sternum stand out.
- * The pectoral muscle waste away.
- The body fat may be abs cent
- Anaemia & odema may be present

Judgment - total condemenation

N.B.: In case of laying breeds at the end of laying period carcass appear poor, so in this case it is important to differentiate between poorness (physiological) and emaciation pathological.

4- *odema and Ascites*

causes:-

Tumors of the internal organs & accompined peritonitis.

Judgment

mild

cond. oedomatus organ.

Sever

total condemenation.

5- *Turkey green muscle disease* (Oregon 'S disease)

cause:

unknown (may be hereditary factor)

position unilateral or bilateral green discolouration of pectoral muscle

Judgment :

Trimming of the affected muscle

NB. If this condition is affecting more than 5% of slaughtered turkey, every carcass should be examined separately & inspected by transverse cut into the breast muscle:

6-Feather - picking (cannablism)

Abscess in the head and neck regions

Judgment

local cond. of the affected parts.

7-Bone and joints affactions

In flammation or abscesses in the joint **Judgment:**
according to specific disease.

Poultry meat borne infections and intoxications:

1- Salmonellosis.

2- Staph. aureus infection

3- Cl. perfringes infection

4- Campylobacter infection.

5- Yersinosis.

6- listeriosis.

Factors help in diffuse poultry meat borne infections:

- 1-Inadequate cooling
- 2-Inadequate thawing.
- 3-Inadequate thermal processing.
- 4-Inadequate reheating
5. Inadequate raw food consumption.
- 6- Infections persons

Control of poultry meat borne infections:

- 1- Eradication of rodents and flies
- 2- Good hygienic measures.
- 3- Prevent diseased poultry to enter the plant
- 4- Prevent slaughtering outside the plant
- 5- Change water used for scalding & defeathering.
- 6- Water used for washing must be running water.
- 7- Avoid over scalding

Rabbit Inspection

Ante mortem and postmortem inspection is similar to poultry

Affections reported during P/M inspection

1- Death before slaughter

- Dead Rabbit before slaughter sh. be detected in AIM and not presented to processing plant

If it is entering the plant, lesions appear as following:

- The muscles dark red than normal (whitish)
- Engorged bi. Vessels supplying the viscera
- * Picture of badly bled carcass

Jud : Condemn

2-Badly -bled carcass

Occurs in dead - over stressed- fevered -diseased with septicemic disease

Lesion

Congested and engorged bl. Vessels,
The flesh is dark

Organs & its L.nodes are congested

Jud: condemn.

3- Injuries: including bruising and broken bones

Skin wounds, bruising & fractures usually associated with haemorrhages and also secondary bacterial infection

- **slight injuries & bruising**— trimming of the affected part
- **Fractures** —cond. at the nearest joint
- **extensive cases with haemorrhage in body tissues or abscesses** -cond. the whole carcass

4-Enteritis (Tyzzers dis)

- Enteritis has many causes including *Bacillus piliformis* which cause Tyzzers dis
 - Lesions vary greatly from a mild enteritis involving the whole gut to haemorrhagic enteritis with blood stained contents
 - The gut contents may be either watery or mucoid especially in the caecum

Tyzzler's dis.

- Acute contagious dis. Associated with haemorrhagic enteritis & necrosis of the terminal ileum, large intestine & caecum “typhlitis”
 - Focal necrotic patches on liver & heart

Cause

B. piliformis

Jud.

All cases usually emaciated, So needs condemnation

5- Mastitis /metritis

- Mastitis usually associated with *staph*, & *strept*.
Metritis usually associated with *staph*, *pasteurella* or *listeria monocytogenes*

Jud.

Ace. To extent of lesions, condition of carcass but usually carcass is unfit.

6- Tumours

- It is difficult to distinguish between benign and malignant tumours in the meat plant.

.Jud

Multiple or malignant tumours

Reject carcass & offals

Single or Benign tumours

Reject the tumour & surrounding tissue

7- Pasteurellosis

- Highly contagious dis. Caused by *p.multocida*
Ch. by rhinitis, bronchopneumonia middle ear dis genital infection Abscesses which may leads to septicaemia

iud:

Depend on degree & extent of lesions and condition of carcass
light cases (Rhinitis) —may be pass
Sever cases (pneumonia & more) —condernn.

8- Spirochaetosis (rabbit syphilis)

Cause

spirochaete Treponema cuniculi

local infection of vesicles which become moist scaly crusts on genitalia .

Jud.

Well nourished carcass—remove the affected part

9- Myxomatosis

- **Caused** by a various virus and spread by rabbit flea

Symptoms

- conjunctivitis with clear discharge wh. Becoms purulent—dryness & crust formation
- swelling of eye lids, base of ear & nose all leads to enlargment of the head
- oedamatus ear often drops
- these swellings may be due to fleshy turnours and may extend to genitalia & anus
- spleen is enlarged & blackish

jud.

Condemn

10- Coccidiosis

Hepatic form

Cause

Eimeria stiedae

Lesion

Enlarged liver with greyish white nodules

Intestinal form

Cause

Eimeria magna, irresidua. perforans

Lesion

Enlargement of duodenum

Petechial haemorrhage of cecum

Thickened & pale intestinal

Jud.

If there is no emaciation, condemn only affected parts.
liver in hepatic form & intestine & GIT in intestinal form

11- Taenia Taeniaeformis

intermediate larval form of this cat tape worm occurs as whitish cyst in the rabbit liver

Jud.

Local trimming or cond. of the affected organ

12-. Multiceps serialis

The cystic stage of *Taenia serialis* of the dog

Common in rabbit, size from hazel nut to hen's egg

Cysts found in the C.T. of lumbar muscles, muscles of hind legs and occasionally at the angle of the jaw

13- *Cysticercus pisiformis*

The cystic stage of *Taenia pisiformis* or *serrata* of the dog present in peritoneal cavity of rabbit especially on the Mesentery

Size from pea to hazzel nut size and cysts contain clear fluid

14- Zoonoses

- 1- **Salmonellosis** *S. typhimurium*

Enlarged liver & spleen, congested carcass

Usually no diarrhoea the dangerous form of sal.

- 2- **Tuberculosis**

avian, bovine type usually cause it in rabbit

jud in 1, 2. Condemn

- 3- **Pseudotuberculosis** *pasteurella*

pseudotuberculosis

ch. By nodules resemble that of T.B. in liver lung

spleen & intestine

Jud. Condemn

- 4- **Listeriosis** *listeria monocytogenes*
Serious loss of condition and emaciation,
Torticollis (Nervous manifestation)
hepatitis with presence of numerous fine necrotic foci in
the parenchyma
jud condemn
- 5- **Ring worm**
trichophyton mentagrophytes var. granulare
typical lesions usually present on head and may spread
to
other parts of the body
- **jud.** Good condition of carcass condemn head & carc as
approved

15- Snufftes dis (contag. Cattahral. Dis.)

Strept, staph, pasteurilla & coliform

Tracheaitis, pneuinonia, pleursy, pericarditis.

Jud.

Acc. To severity of dis & condition of carcass

16- sore hocks

due to rubbing on the wire floor of cages secondary infection
abscess formation may lead to pyaemia with abscesses in the
kidney

jud.

Localized- trimming
pyaemia- T.C.

17- Nephritis

toxoplasma gondii

congested carcass & oedematous
kidney enlarged and contain greyish patches
in chronic cases these patches are pitted
emaciated carcass

18- Gastroenteritis

Bacterial & parasitic (round worms)
diffuse enteritis, watery, mucoid & haemorrhagic.

jud.

Depend on the state of carcass

Thank you