

BREAK OUT ANALYSIS OF UN HATCHED EGGS

AISHA KHATOON and ZAIN UL ABIDIN

Department of Pathology University of Agriculture Faisalabad Pakistan

Hatch Break out Analysis

A hatch breakout analysis involves opening un-hatched eggs (Dead-in-Shell) to determine at what stage of incubation embryo mortality has occurred. A useful tool for solving hatch problems and looking for areas to improve hatch performance

Objectives

1. To quantify the number of embryos dying at different stages of development,
2. Look for any indications of abnormal development
3. Other potential causes of hatch loss (e.g. cracks and microbiological contamination).
4. Maintaining quality assurance
5. Analyzing poor hatches

Procedure

Identify 5 sample setter / hatcher trays per breeder flock. Choose the trays from different positions within the incubator. For the sample trays:

1. **Record the number of eggs per tray.**

At fertility testing open all eggs removed from the sample trays as clear or early dead germ. Do not refill the trays after fertility testing. Count the number of culls and cracked eggs on each sample tray and open all un-hatched eggs. Record results on record sheet; express mortality as percent of eggs incubated. Record whether the hatch debris was clean or dirty,

Suggested Staging for Embryos

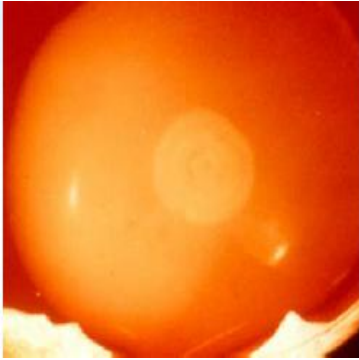
• Infertile

There will be no sign of embryo development, clear albumen and yellow yolk with white dot



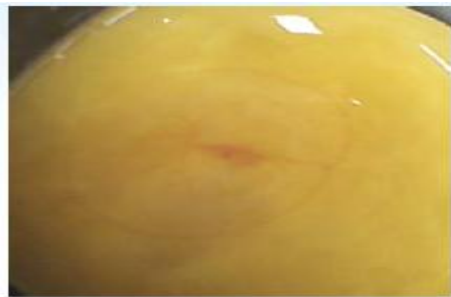
- **Died 1 – 2 days**

Presence of white disc > 1cm on yolk, albumen may be cloudy, no evidence of blood vessels.



- **Died 3 – 9 days**

First sign of blood vessels on yolk up to embryo with limbs and beak visible but no egg tooth present (white dot on end of beak).



- **Died 10 – 15 days**

Egg tooth visible until first feathers present.



- **Died 16 – 24 days**

Feathers first present until the embryo starts to withdraw yolk sac and moves into hatching position (head under right wing)



- **Pipped dead**

Shell pipped but embryo died.

- **Pipped alive**

Shell pipped and embryo still alive.

Note if the membranes and feathers are dry or wet. This indicates whether the embryo has been pipped for a long time but has been unable to emerge from the shell or is a late hatching embryo.



3. **Record any malpositioned embryos:**

- Type I – head between legs (normal position before day 25).
- Type II – head in small end of egg.
- Type III – head under left wing.

- Type IV – head pointing away from air cell (rare).
- Type V – leg over head.
- Type VI – head on top of right wing.

4. Record any abnormalities:

- Beak deformities – short upper or lower, parrot beak, crossed beak or notch in upper beak.
- Body abnormalities – multiple limbs, deformed head, short legs open body or cranial cavity.



Short Legs

Abnormal Feathers



- Dwarfed – small embryo for stage of development.
- Eye abnormalities – missing eye (s), eye cataracts



- Leg or head trapped by yolk sac.
- Swollen head or body – odema



5. Record any contamination:

- Mould growth.
- Smelly or exploding eggs.
- Where egg contents have curdled.

The presence of black liquid around the embryo is not a sign of microbial contamination – this is caused by the normal breakdown of tissues following death.

6. Record any cracked eggs:

The location of the crack may be an indication of the cause of the damage. The degree to which the egg contents have dried will indicate how early the crack occurred during incubation.

Note

In a good hatching flock there are two main periods of embryo mortality: 3 – 10 days and 25 – 27 days + pips. High mortality at other development stages is not normal. A high incidence of mortality at a particular stage of development can indicate an acute problem during incubation caused by a machine failure. A chronic problem, such as slight overheating, may result in mortality later in incubation.

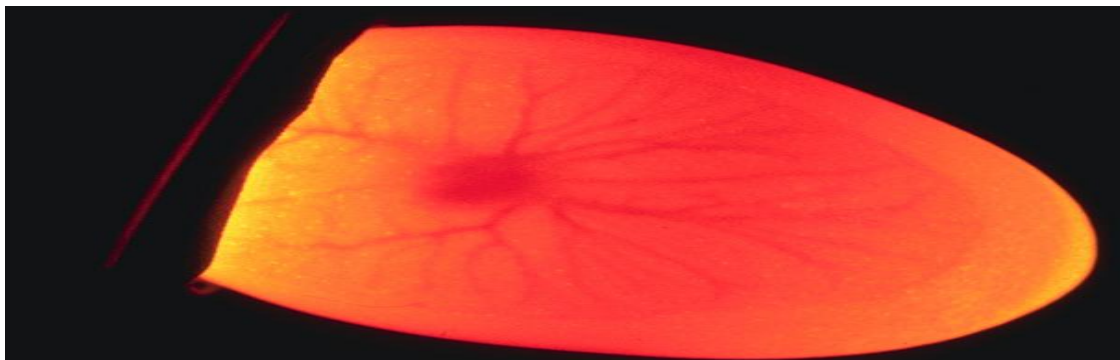
When eggs are candled after the first mortality peak at 7 to 10 days, three distinct classes can be recognized:

- Living Normal embryos
- Blood Rings
- Clears

Living Normal Embryos

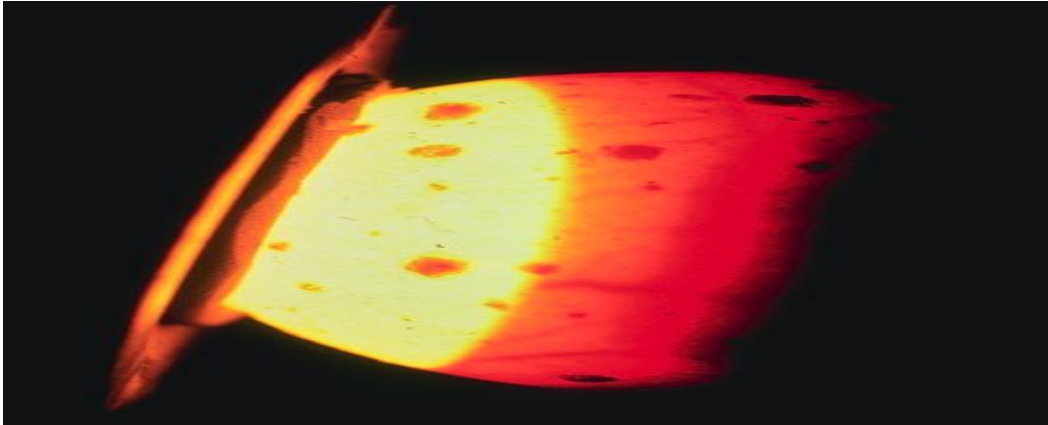
They will show clearly defined blood vessels with no hemorrhagic areas evident. Some body movement when stimulated by the candling light. A generally "healthy" appearance

Four-day-old normally developing chicken - candled



The dark area near the center of the egg is the embryo; the radiating lines are the blood vessels of the extra-embryonic membranes

Twenty-four-day-old turkey - candled

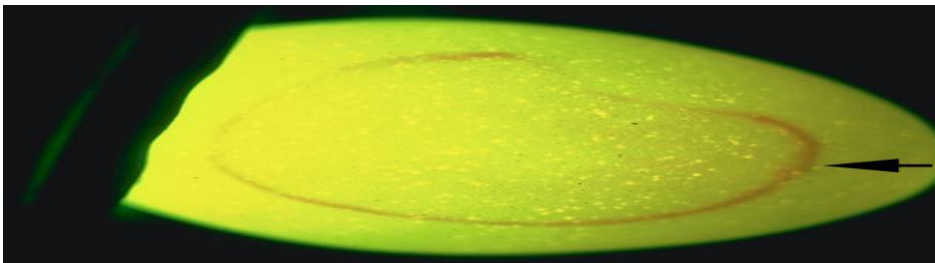


The light upper part is the enlarged air cell which is important for proper hatching. The dark, lower part contains the embryo.

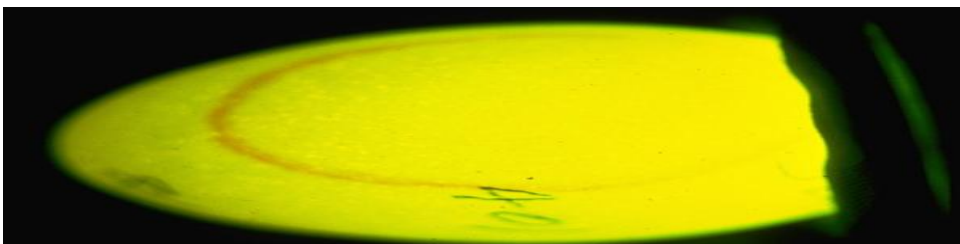
Blood Rings and Dead Embryos

These eggs show a ring of blood outlined on the inner surface of the shell. They usually contain fairly advanced embryos which have died only recently.

Blastoderm without embryo (BWE) chicken eggs



Cystic embryo in chicken egg



Clears

They may be classified as:

- Fertile Eggs
- True Infertiles
- Fertile, No Development (FND)
- Positive Development

This term is used for eggs that show no development when candled. Under normal circumstances, more than half of the clears are true infertiles. The others comprise the dead-embryo categories listed and shown in the photos. These are not true fertility problems and, especially where they are abundant must be identified correctly so that measures can be taken to remedy the specific problem.