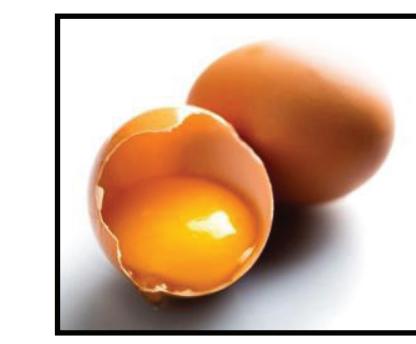
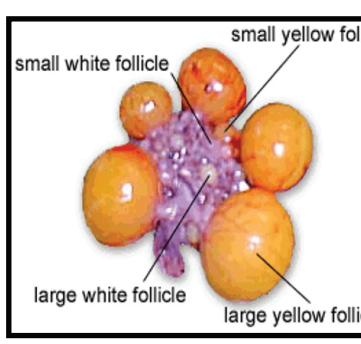
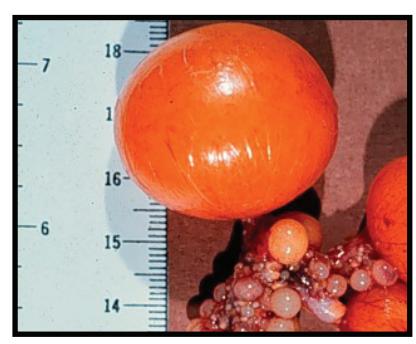
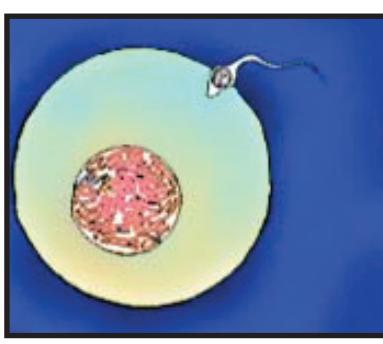


# Development of the Chicken Embryo



Fertilization is the process which enables development of the gamete and begins with contact between a sperm cell and ovum. Embryology is the study of the development of the fertilized single cell egg into a complex multi-cellular individual. It covers development from fertilization to hatching.

In most avian species, only the left ovary and oviduct develop and are active. The left oviduct contains numerous follicles, which will develop into a mature ovum (yolk). The zygote is formed following syngamy of the male and female pronuclei (Sperm and ovum).

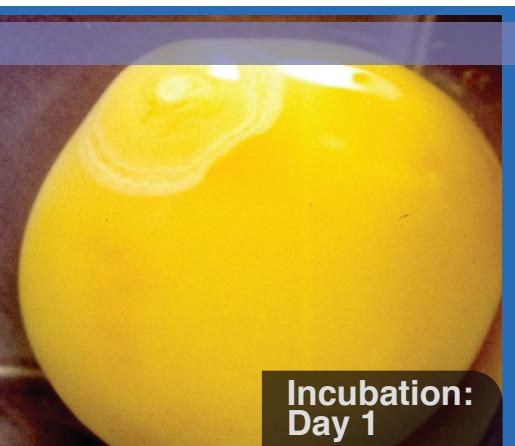
The hen's ovary contains a cluster of yolk that form a hierarchy as they develop. Each mature ovum is a single cell, containing yolk material which will be food for the developing embryo, with the female nuclear material contained in the germinal disc. All are held together by the very thin vitelline membrane.

The mature ovum are released from the ovary, usually one at a time, about 24 hours apart. The ovum is fertilized while in the infundibulum of the oviduct. During egg formation, embryonic development continues by cell division and will result in 40-60,000 cells at the time of lay.

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The germinal disc appears as in this photo. After fertilization, the formation of a blastocoele (fluid-filled cavity) is visible as a donut, or ring, and accommodates cell movement in the developing embryo. This creates a less dense central area which causes the appearance of a white ring over the germinal disc.

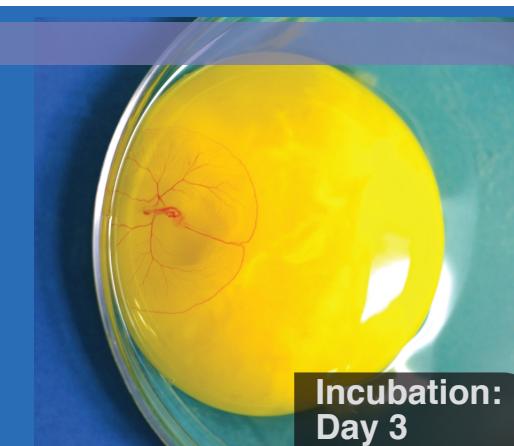
\*\* This wall chart is supplied with the compliments of your Jamesway distributor, to assist hatchery personnel in having a better understanding of egg handling, incubation and hatching, and achieving a Platinum Chicks TM hatch. Jamesway provides a range of hatchery solutions to suit your hatchery needs, and products are distributed and serviced worldwide.\*\*



Incubation: Day 1



Incubation: Day 2



Incubation: Day 3



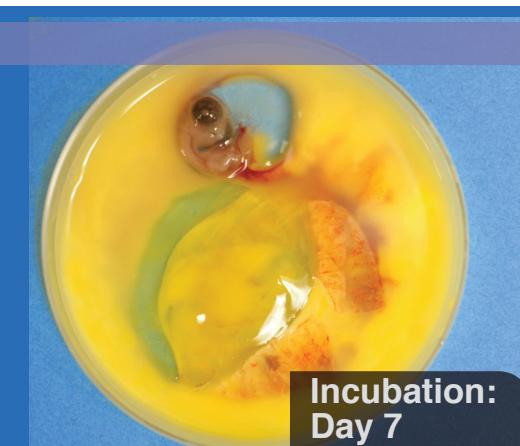
Incubation: Day 4



Incubation: Day 5

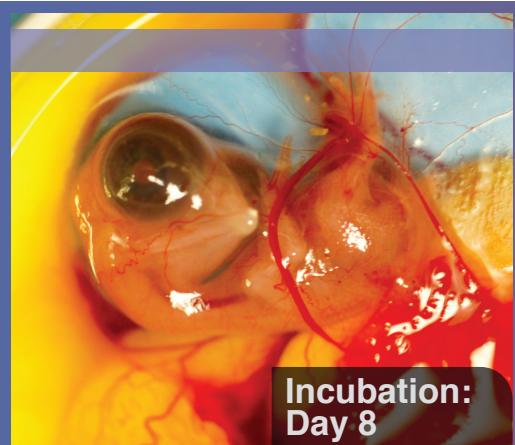


Incubation: Day 6

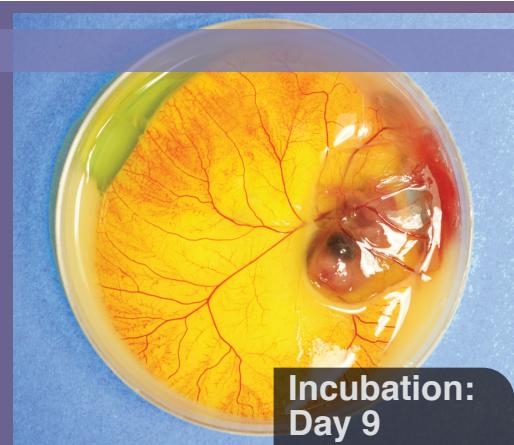


Incubation: Day 7

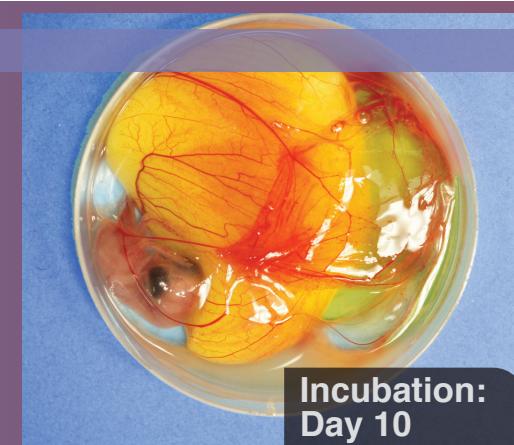
Endothermic Stage



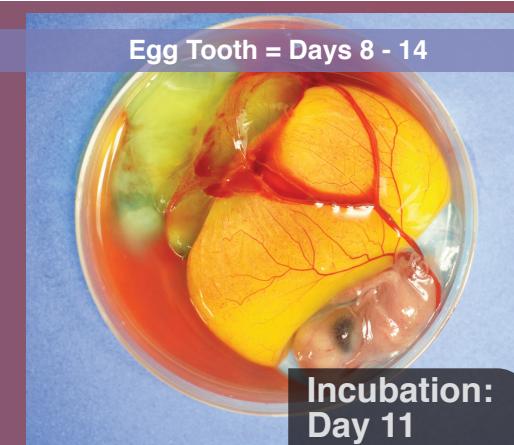
Incubation: Day 8



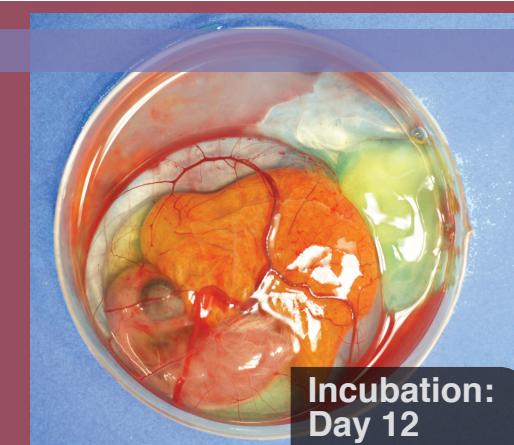
Incubation: Day 9



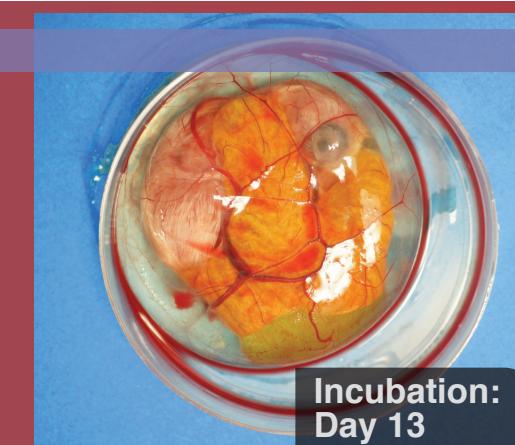
Incubation: Day 10



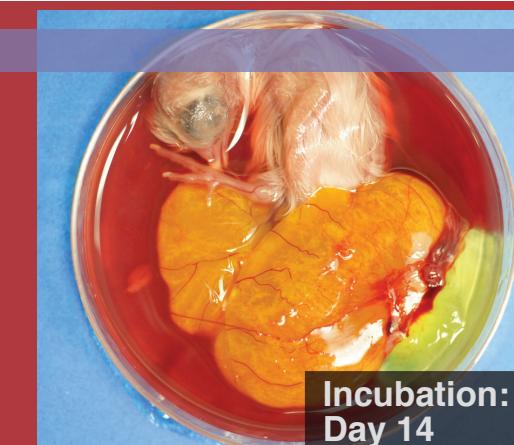
Incubation: Day 11



Incubation: Day 12

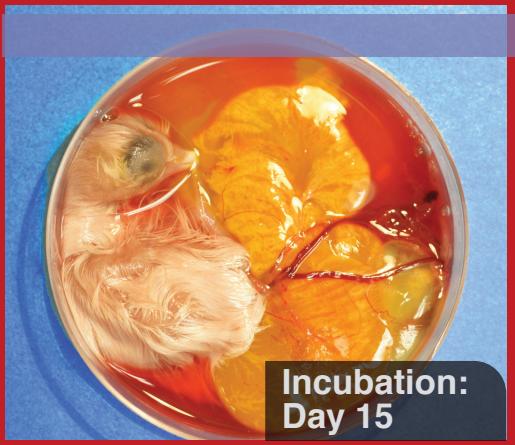


Incubation: Day 13



Incubation: Day 14

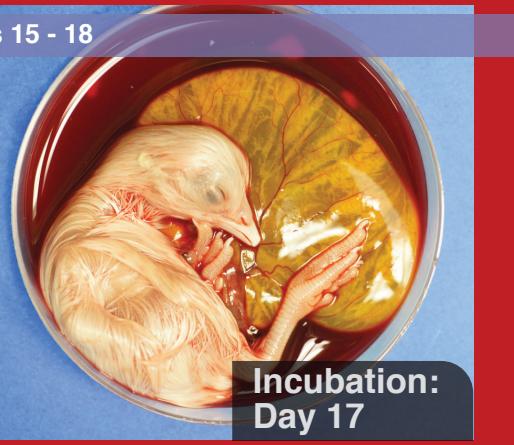
Neutral Stage



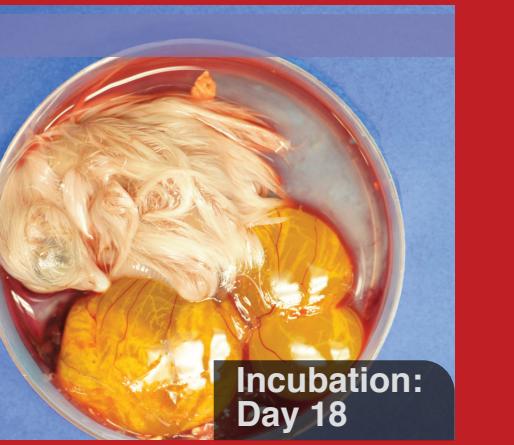
Incubation: Day 15



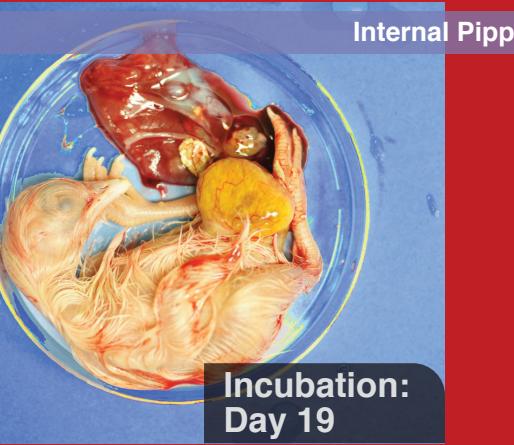
Incubation: Day 16



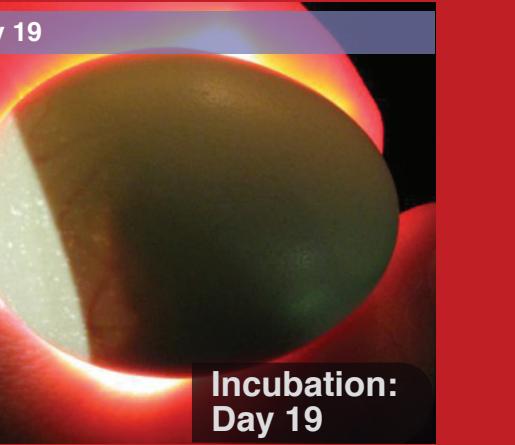
Incubation: Day 17



Incubation: Day 18

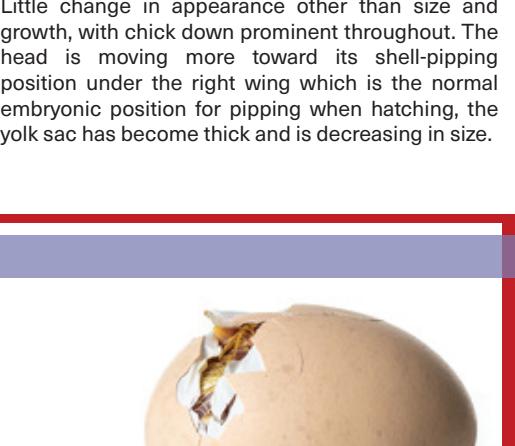


Incubation: Day 19

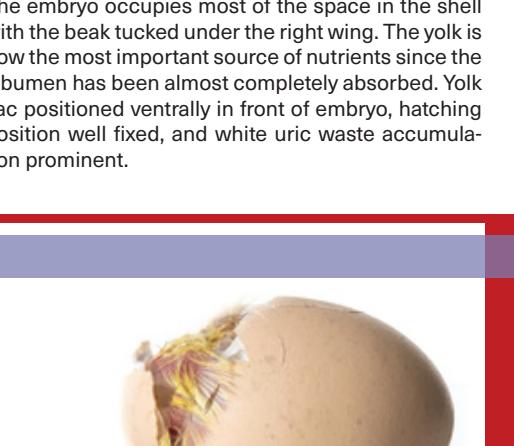


Incubation: Day 20

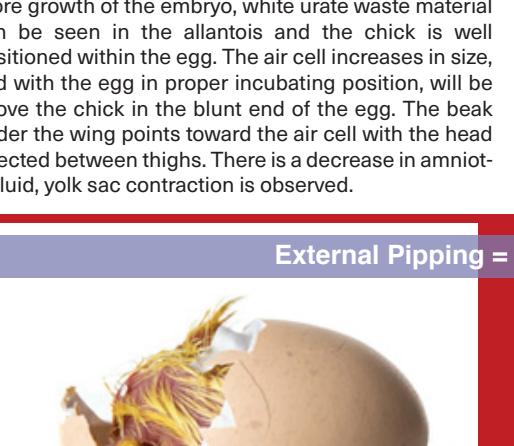
Exothermic Stage



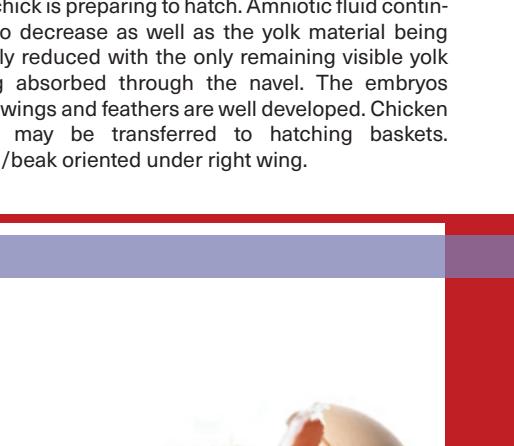
Incubation: Day 20



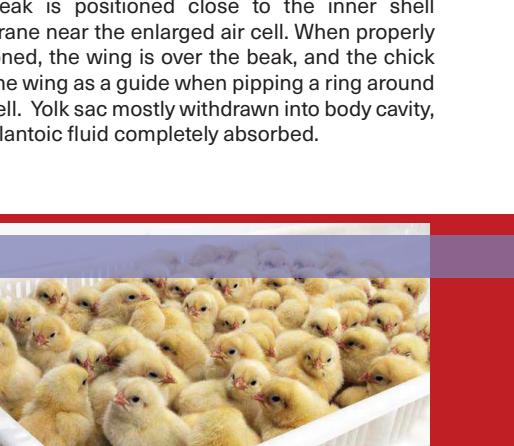
Incubation: Day 20



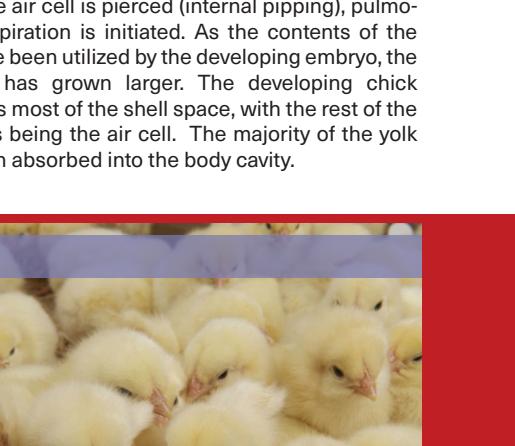
Incubation: Day 20



Incubation: Day 20

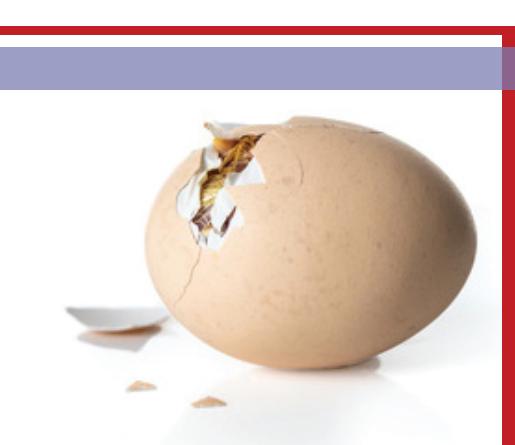


Incubation: Day 20

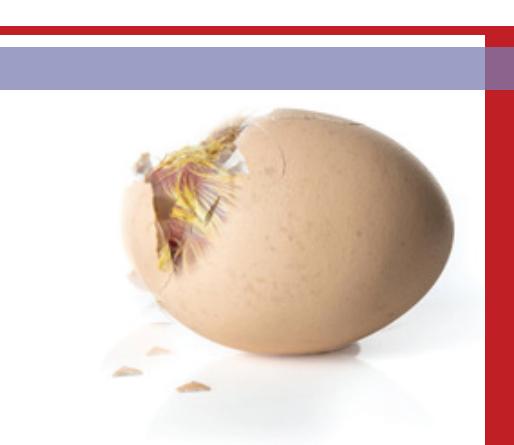


Incubation: Day 20

Hatching



Using its piping beak as a hammer, the chick breaks the shell and enlarges the opening. It can now breath free atmospheric air. Humidity is very important at this stage to prevent drying out of shell membranes and to prevent the shell from sticking to the down.



By pushing with its legs and feet the hatching chick turns its body, and still using the wing as its guide, breaks a ring around the shell. If the down sticks to the shell the chick can't turn and will not hatch.



Eggs will hatch during the 20th day of incubation and will often take 12-18 hours of continuous muscular exertion on the part of the chick to get completely free of the shell.



With one final heave the shell lid is opened and with a little more effort the chick is free to join the other newly hatched chicks. While wet it will look a little scruffy, but it should soon dry and become fluffy and active.



When incubation and hatching conditions are ideal, the chicks will hatch within a 20-24 hatch window. When the baskets are pulled from the hatcher, most of the chicks should be dry and active. The chicks must then rest for a few hours after they are pulled before their gut is ready for the consumption of feed and water.



If incubating and hatching conditions have been ideal, most of the hatch will resemble these fluffy, sturdy chicks, when the baskets are pulled from the hatcher.

Original photographs and commentary by Jamesway Chick Master's Embryologist and Director of Hatchery Consultants Dr. Keith Bramwell, PhD.

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