

Embryonic Mortality in the Incubator

by Rick Jordan
Luv Them Birds, Inc.
Miami, Florida

As the interest in the propagation of Psittacine birds increases, manufacturers of products that used to pertain only to the poultry business are becoming more interested in the new market potential. The results are brooding units and egg incubation units that are designed specifically for parrots.

Many of the new designs are simple modifications to accommodate Psittacine type eggs and chicks rather than those of precocial type birds. Brooding modifications for altricial chicks incorporate the need for isolation from each other and to protect them from invasive bacteria or viruses. Egg incubator modifications must accommodate eggs in the natu-

ral position rather than the vertical position used to hatch domesticated poultry.

These slight differences in the protocol and care for altricial birds has stimulated new design in nursery equipment. A new market has arisen from the need to breed parrots for the pet and breeder trade. No longer can the trade rely on unlimited imported stock. The captive parrots of the future will be domestically produced and breeders will rely on innovative ideas and new-found knowledge to increase productivity.

Early Embryonic Death

Eggs that die in the first few days of life are difficult to distinguish from infertile eggs. The telltale signs of fertility are evident if the "germ" or white speck on the yolk is examined very closely. The infertile egg will appear as simply a small white spot (blastodisc) on the yolk. The early dead embryo of a fertile egg will often appear as a white spot with a halo or ring around it (blastoderm).

Early death occurs for numerous reasons. Many of these are uncontrollable factors that cannot be changed or improved through better

avicultural practices. Nutritional deficiencies or genetic incompatibility can cause these early deaths and it is impossible to distinguish one cause from the other. A properly maintained flock should produce a high fertility and hatch rate of eggs that are laid. Consistent infertility or early dead embryos may indicate a need for a change in nutrition. Sporadic pairings that yield many early dead embryos could indicate some type of genetic incompatibility and these pairs could be split and re-paired for better results.

One cause of early embryonic death that may be diagnosed by the "sharp" aviculturist occurs when the eggs spends an unusually long period of time in the uterus of the hen. During the breeding season, many hens will swell in the area of the vent as the egg is being shelled in the uterus. This swelling is usually noticeable on small or mid-sized birds. It is very difficult to see in macaws and cockatoos. The normal amount of time between the swelling and the laying of the eggs is about 48 to 72 hours. There have been cases where the first egg has remained in the uterus for a week or longer before being



For the Life of your Bird

ROUDYBUSH



* Handfeeding Formulas for Baby Birds.

— Psittacines

— Nectivores

— Squab

— Wildlife Rehab.

* Maintenance Pellets and Crumbles. * Nectars

* Breeder Pellets and Crumbles. * Medicated Pellets and Crumbles.

These convenient foods have been formulated based on data from university research. The handfeeding formulas just mix with warm water. With pellets and crumbles there is no expense and mess due to seed hulls, and there is good nutrition in every bite. All of our products exclude animal and fish byproducts to eliminate potential sources of gram negative bacteria.

Let Tom Roudybush, one of the world's leading pet bird nutritionists, be your bird's nutritionist.

For more information, please contact us:

P.O. Box 908, Templeton, CA 93465-0908

Phone (805) 434-0303 or 1 (800) 326-1726

laid. These eggs rarely develop and hatch. Upon close inspection of the blastoderm, it can be determined that the embryo died before development progressed significantly to be noticeable through candling. Most aviculturists would simply assume the egg was not fertile. The truth is that the embryo dies from an extended amount of time in the high temperature of the hen's body.

Other causes of very early embryonic death include controllable factors such as the temperature in the nest box. On extremely cold or extremely hot days, eggs may die in the nest shortly after they are laid. When weather is expected to be extreme, pulling eggs into the incubator may be a wise decision.

Parents birds that are rough with the eggs may cause death to the blastoderm. If the internal structure of the egg is damaged from rough handling, fertile eggs will not begin to develop and often appear to be infertile. Upon close inspection there may be an indication that this is the case. If the yolk of the egg is broken or moves very freely as if it has been jolted loose, the egg may have been handled improperly. Sometimes the membrane that separates the air cell from the liquid portion of the egg is broken and air flows freely through the egg. This is also an indication that the egg has been addled.

In the incubator, early death that cannot be traced to a previous problem in the nestbox is usually caused by one of two things. The most common cause of these mortalities is an incubator that vibrates or has an unusually rough turning unit. The second cause of death is improper temperatures. Close observation by the aviculturist is required to determine if either of these factors could be the cause in an inordinate amount of early dead embryos.

The First Ten Days

The beginning developments of the embryo are very delicate. The tiny blood vessels and pools that develop in the first week can be disrupted and death will occur simultaneously. Embryos that are in their first week of development are even more fragile than freshly laid eggs. Once the blood pools begin to grow, any disruption will cause death to the associated embryo.

Candling of fertile eggs in the first week of development usually appears as a small red circle with a

very faint outline of the chick in the middle of the ring. This ring continues to grow and as it increases in size the embryo becomes easier to see. Once the embryonic ring has reached about 8 or 10 centimeters in diameter it should be possible to see the small blood vessels that connect the chick to the outer circle of development.

At this stage, the turning of the eggs and incubator vibrations can be cited in a majority of cases of embryonic death. If eggs are not turned properly, and on a regular basis, the embryo will adhere to the inner shell membrane and may be damaged when turning commences. In cases where only a few blood vessels have become attached to the inner membrane, the embryo undergoes some repairable damage. For the next few days development may be "patchy" but the chick usually survives and will continue to grow in a normal manner after only a day or two.

Incubator vibration has a detrimental effect on the delicate blood vessels of the young embryos. An effective test for vibrations is to place a paper cup with some water in it on top of the incubator unit. If the unit is vibrating enough to disrupt the surface of the water, it will have a negative effect on the eggs. The use of a rubber pad under the unit may soften the vibrations. In some cases it is the turning unit that vibrates during the automatic turning process. Steps must be taken to eliminate the vibration, or the eggs should be carefully turned by hand for the first two weeks.

Third Week (or Mid-Developmental) Deaths

Deaths that occur in eggs during this time period are most difficult to diagnose. This is probably due to the fact that the conditions for incubation were close enough to ideal to support growth, but not exact enough for the chick to complete its development. The subtle environmental faults leave very little evidence why the chick died. On occasion there are noticeable anomalies that may provide a hint.

Turning and position errors will often be apparent upon candling the dead eggs of this developmental stage. By the second or third week of development, the blood vessels should extend throughout the entire liquid portion of the egg. Turning

and position errors are often noticeable by placing the light of the candler against the small end of the egg to view the sections of clear liquid that contain no blood vessels. If these undeveloped areas are too large, the embryo will die before beginning the hatching phase of growth. By candling numerous eggs in this stage of development, one learns to determine whether or not this is an area of fatal proportions.

Temperature related deaths that occur in the third week of life are almost impossible to distinguish. If a severe temperature fluctuation has occurred and the aviculturist is aware of it, the death may be explained. Small fluctuations that occur for several hours at a time are usually of no consequence. When the eggs have become very cold or very hot for more than a day, the chicks that live to hatch will usually have respiratory or organ damage and be problems in the nursery. These chicks often die in the first week after hatch.

Late Embryonic Death

Eggs that live and develop to the last few days prior to hatch will usually yield some information relevant to cause of death. Necrosis takes place at a rapid rate once the embryo dies and telltale clues become more difficult to recognize, so a necropsy of the egg should be performed as soon as the egg has died.

High humidity deaths are very prevalent in Psittacine incubation. This is due, in part, to the recommended humidity levels for incubation. Parrot rules do not follow the same rules for incubation as chicken and other domestic poultry. Many of the incubators that are available to, and affordable by, the small aviculturist are designed for poultry. Along with these incubators there is usually some accompanying literature that implies that parrots come from the tropics and therefore "must be incubated at high humidity." This is not true and has led to the death of literally thousands of Psittacine eggs.

High humidity deaths occur directly before or during the hatching process. The chick's body is often inflated with extra fluids that restrict its movement in the egg. This results in a situation where the chick cannot maneuver its head into the proper hatching position and it drowns. In most cases, the chick dies before it can bring its head into the airspace.

Other late developmental deaths

may be associated with malpositioning within the egg. Without assistance, approximately 50% of all malpositioned chicks will die during hatch. In cases where the egg was incubated at a low humidity and there is room for the chick to maneuver, they often hatch with little or no assistance. The position of the egg during incubation plays a big role in the position of the chick when hatch time arrives. Incubators that are designed for parrot eggs accommodate the eggs in the natural position. This has resulted in a decrease incidence of malpositioning and a higher overall hatch rate.

Bacterial Deaths

Death caused by bacteria in the egg seems to be very rare. Due to the protection capability of the eggshell and its associated membranes, bacteria and viruses are rarely capable of penetrating the egg and infecting the growing embryo.

In cases where the eggshell has been compromised from an early age, there are risks involved if the incubator is not maintained in clean order. Rotten eggs that are removed from the nest are almost always cracked. These cracks allow the invasion of bacteria and the contents of the egg will often decay.

In my experience, as few as one egg in 500 may actually have some type of bacterial problem. This includes those eggs that are cracked when they are placed into the incubation units.

Summary

Being in a position to speak with many aviculturists on a daily basis, I believe that high humidity incubation is the cause of approximately 90% of all incubation and hatching deaths. The recommended humidity levels for incubation have been adjusted to remedy this situation. The 50% relative humidity settings of yesterday are being adjusted to 44 to 48% and results are positive. Hatching humidity is still maintained at a high level to avoid hatch difficulty.

Since the advent of incubation units designed specifically for parrots, egg are being incubated in the natural position. This has resulted in a much lower incidence of malposition. Aviculturists who use incubators designed for poultry must re-position eggs often or manage to place eggs in the trays in a more natural position. ●

2-1 Peanut Toy —the 2 day peanut stick

100% natural & spicy, for all pet parrots.
For \$1.50 you really get your money's worth.
12 peanut sticks for \$18.00 plus 2 free toys!

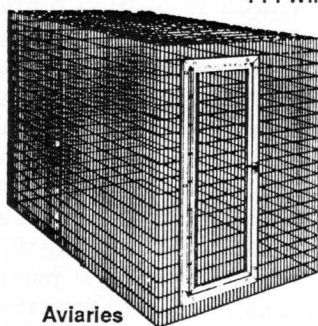
Send check to: **HD PET PRODUCTS**
9805 NW 80th Ave., #13U, Hialeah Gardens, FL 33016
(Florida residents add 6-1/2% sales tax)



California Cageworks Corp.

Quality cage products

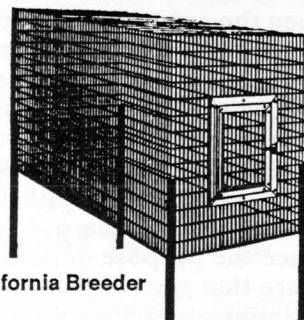
... will enhance the breeding potential of your birds



Aviaries

1/2" x 3" Mesh 12 ga.
suitable for
everything from
Finch to Macaws.

1" x 3" Mesh 10 ga.
suitable for
larger Amazons,
Macaws and Cockatoos.

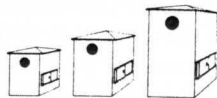


California Breeder

- Most versatile cage on the market today
- Used by many well-known breeders and bird farms



Roll Wire



Metal Nest Boxes



1" x 1"
Square Tube



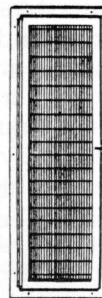
Wire latch



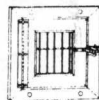
Spring latch



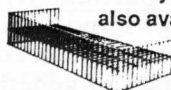
Spring
loaded
clip pliers



Doors



9" x 9" and 12" x 12"
Feed Doors
with inside
Feed Trays
also available



Custom Aviary Design
Single Units • Breeding Complexes
Wind Panels • Roof Structures

Call or write for more information.

1 (818) 843-MATE
Fax 1 (818) 843-7409

HOURS:
Monday - Friday, 9 a.m. - 5 p.m.
Saturday, 10 a.m. - 2 p.m.

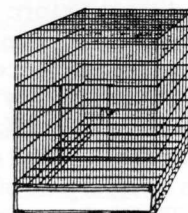
3314 Burton Ave., Burbank, CA 91504



NATIONWIDE SHIPPING



Quality cage products at prices that don't bite!



Cages