

The world's first contact incubator



CONTAQ X8

A year ago Brinsea Products launched the world's first incubator based on Contact Incubation Technology – the Contaq X8. Now it is in use by leading breeders in Britain and around the world.

So what is CIT and how is it working in the field? Ian Pearce, Managing Director of Brinsea Products Ltd, answers these questions.

CIT is, at its simplest, reproducing the environment of the nest for artificial incubation. Compare a conventional incubator with a real nest. The conventional incubator surrounds the egg with warm air: the nest has a warm bird sitting on the top of the egg, but the bottom of the egg rests in a cold, and sometimes draughty, nest. At irregular intervals the bird gets up, leaving the egg fully exposed, before turning it. In some species the egg will be left for long periods of time while the hen is feeding.

Academic research has looked carefully at the role of heat in an incubating egg. It has discovered that in many cases heat flowing from a warm spot on the top of the egg, is an important factor in the development of a strong embryo. So together commonsense observation

and scientific research suggest that the standard incubator may not be the best way for hatching every species.



Comparison of heat flow in naturally and artificially incubated eggs

Conventional incubators still have an important role to play. Chickens, for example, have been artificially incubated for many generations, and today's birds are the descendents of those who thrived in these conditions. In these volume markets a percentage of failed eggs is also acceptable.

But for other breeds, particularly those where every egg is important, a better method of incubation is needed, and that is where CIT comes in.

Creating a nest

To re-create the brooding bird CIT uses a plastic artificial skin, inflated with warm air, that rests on top of the eggs. The eggs, in turn, rest on rollers. At intervals the skin deflates, recreating the bird standing, and the eggs are turned by the rollers.

An American Breeder

We successfully hatched a Hyacinth Macaw egg using the Contaq!

Other babies that were incubated successfully in the Brinsea X8:

5 total Umbrella Toos, 2 Congo African Greys, 2 Black Headed Caiques, 2 Senegal Parrots and 3 Green Cheek Conures

The machine is wonderful! Thanks so much!!!

A user programmable micro-processor controls the temperature of the air in the skin and the humidity of the nest chamber. The user also sets the frequency of inflating and deflating the artificial skin and the frequency and amount of egg turning.

The result is a reproduction of the natural nest without any of the hazards of accidental damage or predation, which the natural nest is subject to.

Real products

The first product ever to incorporate CIT is the Brinsea Contaq X8. This was launched in Spring 2003, after extensive trials with prototype machines. In the UK the first complete breeding season using production products has been completed, and we are overwhelmed at the success.

Some of the facts and figures are in the rest of this newsletter, but just one measure is an indication: we estimate that around 30% of all commercial falcons bred in the UK in 2004 were incubated in the Contaq X8, a machine that wasn't available before the start of the season.

Inside - you can read about the success of the falconers, about a parrot breeder's experience and also the preliminary results of trials that have been taking place at the University of Lincoln by incubation expert, Dr Charles Deeming.

A Parrot breeder in the English Midlands

Of the first 48 eggs I put into it [the Contaq X8], 36 hatched, and some of those that didn't were clearly not fertile. This is a far better rate than I was getting with my earlier machine.

African Grey Parrots



More eggs hatch with new technology

An experienced Midland parrot breeder has been using the new Brinsea Contaq X8 for incubation and it has produced some very good results.

In his view hatching is, in essence, very simple. "Good hatching requires good breeding birds. Get the birds right, then you have a lot less problems." This includes the overall health of the bird and the relationship between the pair. He prefers to have the birds pair naturally and over the years (now more twenty breeding seasons) he has found that putting a selection of cocks and hens together and letting them select their partners has produced the best results.

Cameras

Once the birds have paired then he watches them closely. "There is a camera in every nest box, so I can see what each pair is up to

without any unnecessary interference." When the egg is laid, what happens next depends very much on what he knows about the behaviour of the hen. "The best way to incubate an African Grey is under a good mother. If a pair is sitting tight, with the cock feeding the hen then I tend to leave them alone. I have even seen an African Grey cock take his turn at sitting on the egg."

With other hens, for example those that are poor sitters, often the best thing is to get the egg away as soon as possible. The egg may go into an incubator or even under a hen. He may also take eggs away from exceptionally fertile hens to encourage further laying.

Confidence

The choice of incubator is vital and he has tried several different incubators over the years. "If you have confidence in the machine, you can hatch anything, but you need a controlled environment." In his experience, the best hatch rates come from a slightly cool environment and low humidity during incubation, with humidity increased for the hatch.

"At the beginning of the last season (Autumn 2003) I was looking for a new incubator, as I couldn't get spares for the old one and I had no confidence in it. I saw an ad for the new Brinsea machine, the Contaq X8, and thought it was worth giving it a try. As I didn't buy it until the season was underway, I just went straight into using it. Of the first 48 eggs I put into it, 36 hatched, and some of those that didn't were clearly not fertile. This is a far better rate than I was getting with my earlier machine." And eggs that go into the incubator are often those that he knows are going to be difficult to hatch.

One of the major benefits he finds with the Contaq X8 is turning. "Turning the eggs frequently and regularly increases the hatch rate." With the Contaq X8 programming the amount of turn, and the time at which turning takes place, is easily programmed into the machine through a simple control panel.

The right incubator

It is very much a matter of choosing the right incubation method for particular circumstances. While the ideal is still the experienced and attentive hen bird, there frequently cases for choosing a different route. And in all these cases the breeder's judgement is an important part of the decision. For this particular breeder an important part in his future is the Contaq X8. "I am generally happy with the hatch rates I am getting, but once I get an even better understanding of the Contaq X8 and how it works I am confident I will get even better rates."

The "breeder in the midlands" has around 40 birds breeding and over twenty years experience. However he prefers to guard both his name and location in anonymity.

A falcon Breeder in Yorkshire

The falcon breeder, in Yorkshire, started the 2003/4 season with a single Contaq X8 and then added a second. All their eggs were incubated in these machines, with a 10% increase over their normal hatch rates.

Trials of CIT

Dr Charles Deeming, the world authority on incubation, has carried out trials of the Contaq X8 to determine the ideal temperature for contact incubation and to compare results with those of a still air incubator.

The study used red-legged partridge eggs, for three reasons: the eggs are easily available in fairly large quantities, at 20g weight they

are close to the weight of more exotic species, such as parrots, and although they have been bred in captivity they have not been selected for artificial incubation as many domestic fowls have.

There were two stages to the study. The first was to discover what was the best air temperature in the artificial skin, the second was to confirm this and to look at the effects of better contact between the skin and the eggs.

In the first three Contaq X8s were set at different temperatures and an Octagon 100 was used as a control. This study showed that a temperature of 40.5° C produced the best hatch rates, compared to the normal 37.5° C in the Octagon. One reason for this was that the temperature of the upper surface of the egg was normally around 3° C lower than the air temperature in the skin.

Unfortunately, during the first trial the eggs were placed directly on the turning mat, rather than on the rollers, and were subject to "turning creep". This meant that as they were turned (120° every hour) they also moved along their long axis and some moved themselves out of contact with the skin and failed to hatch. As a result, the hatch rate in the X8's was lower than the Octagon 100 control. However



Dr Charles Deeming

Welsh based commercial falcon breeder

A commercial falcon breeder used the Contaq X8 to incubate species that are more difficult to hatch achieved 95% hatch rate, when normally they would expect 85% and 90% across all species.

Wildfowl and Wetlands Trust (Slimbridge)

A prototype Contaq X8 machine was used in a controlled experiment for breeding Chilean flamingos. Incubating in the Contaq X8 resulted in 30% more live chicks than conventional incubation.

National Bird of Prey Centre, Gloucestershire

Jemima Parry-Jones used a prototype CIT machine to incubate Eagles, Merlins, Lanners, Owls and others. She says, "We were delighted with the results." She now has several production models.



Contact Incubation trials at Lincoln University

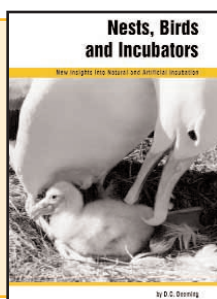
the hatch rates of eggs in the centre of the X8's (which remained in good contact with the heated 'skin') was higher than the control. In the first set of trials the post hatch mortality was also measured, and more chicks from the Contaq X8 survived than from the forced-draught machine.

In the second trial the eggs in two Contaq X8s were placed on the rollers with O rings between them. This both stopped turning creep and brought all eggs in closer contact with the skin. Here the hatch rates were higher than that in the Octagon. Unfortunately survival rates for these chicks was not recorded.

Summarising the results: eggs in the Contaq X8 in close contact with the skin at 40.5° C exceeded the hatch rate in the force-draught machine. Post-hatch survival rates were also improved.

Further trials are planned for 2005.

This is a highly edited abstract of a paper that Dr Deeming presented to the International Fertility Research Group. The complete abstract is on the Brinsea web site at www.brinsea.co.uk/uk/news/citft.html. A written paper is in preparation for publication in 2005. Dr Deeming wishes to express his appreciation of the help of Colin Riches of the University of Lincoln and the university itself.



Nests, Birds and Incubators

Dr Charles Deeming's authoritative book on incubation, is available from Brinsea for £19.95

The falconer's experience

Ian Pearce, Managing Director of Brinsea looks at falcon breeders' results in the first season.

Has the theory of CIT translated into improved breeding results?

We are still gathering data from falcon and other breeders who have used the Contaq X8 during the 2003/4 breeding season, but already there are some clear trends emerging. And we are overwhelmed at the success. One measure is that we estimate that around 30% of all commercial falcons bred in the UK in 2004 were incubated in the Contaq X8. Not bad for the first season of a machine using new technology!

Breeding results

Two of the largest commercial falcon breeders have allowed us to share some of their results. One breeder, based in Wales, used the Contaq X8 for species that are more difficult to hatch. Of 50 viable, fertile eggs in the machine, only 3 failed to hatch. This is almost 95% hatching, higher than their normal average of between 85% and 90% across all species. They plan to add a further Contaq X8 for next year's season.

The second breeder, in Yorkshire, started the season with a single Contaq X8 and then added a second. All their eggs were incubated in these machines, and there was a 10% increase in hatch rates. They too plan to add further machines for next season.

The second machine for this customer had some teething problems. It was delivered in the week before Easter and, after it was assembled, the turning mechanism didn't work. We assembled and thoroughly tested a replacement machine and, on Good Friday, drove it to Yorkshire. (The broad fabric belt that moves the eggs had become stuck to the drive roller – we now stitch the belts rather than glue them.)

Incubation lessons

The best results when using the Contaq X8 appear to be when the air in the membrane is at a higher temperature than with conventional incubators. We would normally recommend around 37.2° C for our incubators, but with CIT the optimum appears to be at least 39° C, close to a birds' body temperature of around 40° C.

The independent research programme, which is comparing CIT with conventional incubation and looking at the results of different temperatures on hatch rates, has found that the shell of the egg in contact with the membrane is measurably cooler than the membrane temperature, which may explain this.

The breeders were not wholly uncritical. Turning, both timing and amount of turn, is programmed into the incubator by the user, but the breeders want confirmation that turning has happened. We are looking at this and plan to implement recording in the next upgrade to the control system.

The general feeling among the other breeders we have spoken to echoes that of the Yorkshire breeder, "It (the Contaq X8) is as good as, if not better than, leaving the egg with the bird." Any serious falcon breeder should look closely at CIT for their next season.



New incubator specifically designed for reptiles

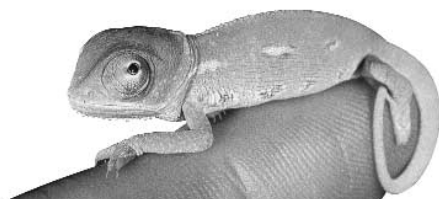
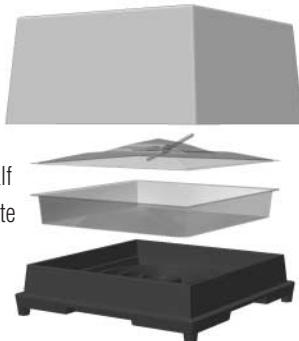
Hatchmaker R provides a safe and reliable controlled environment

The Hatchmaker R, our first incubator designed specifically for the needs of the serious reptile breeder, draws on Brinsea's experience in managing controlled environments to create an incubator which can maintain high humidity (close to 100 per cent) and the finely adjustable temperature that is needed for the successful incubation of reptile and snake eggs.

"Many reptile eggs require very high humidity to hatch successfully," said Ian Pearce, Managing Director. "This, when coupled with the long incubation period, can lead to bacterial growth. The Hatchmaker R's design eliminates condensation and stopping drips falling on to the eggs, a major cause of bacterial problems."

Within the Hatchmaker R, the purpose designed reptilian incubation chamber is half filled with vermiculite soaked in water, in which the eggs are part buried. The chamber lid is fitted with a Brinsea specified thermometer: the close fit of this lid maintains humidity at close to 100 per cent while an adjustable vent provides an oxygen flow. The tough incubator cabinet surrounding the incubation chamber is well insulated and contains the heater, the heater controls and an observation window.

The Brinsea Hatchmaker R is available in versions to run on mains power or on 12 volts, for example a car battery. The normal price of £199.95 includes the incubator, the reptilian incubator chamber, vermiculite, incubation thermometer and full user instructions. However, for a limited introduction period the package is available for just £170.48. (Prices inclusive of VAT).



Robust, Advanced, Temperature-controlled Veterinarian Life Support Chamber

TLC-5M

TLC-5M extends the TLC family of Thermal Life-support Chambers. It is a larger version of the very successful TLC-4M, and is an intensive care unit with accurate control of temperature and humidity, built in connections for an oxygen supply and a nebuliser and the option of a temperature alarm with a phone dialler.



For small animals who are undergoing post-operative care or otherwise sick or injured, or are very young, the TLC-5M provides the perfect environment. Its internal dimensions of 680mm wide, 430mm deep and 470mm high will accommodate animals up to the size of medium sized dogs.

The best gets better

Brinsea's Octagon range is acknowledged as the leader in forced draught incubators for both its ease of use and outstanding reliability. It is now getting even better, with the release of the new Octagon 20DX and Octagon 40DX models.

In these new models, the turning cradle has been upgraded, with a new clutch, for even longer life and the egg dividers have been improved to provide better air-flow and egg protection.

Best of all, if you already have an Octagon 20 or Octagon 40, you can buy an upgrade kit to bring your machine up to the DX standard.



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