

parrot *care*

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incubation procedures and hand feeding

setting up an incubation and hand
feeding room

incubation - temperature, humidity,
techniques and problem solving

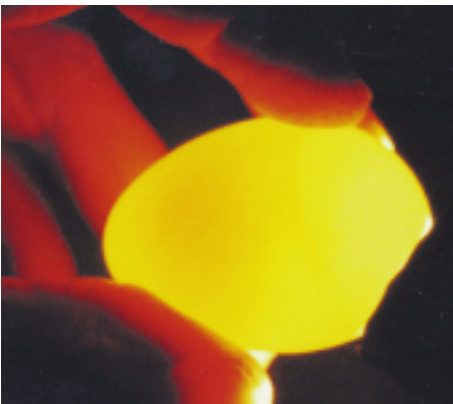
nursery management

John Wragg

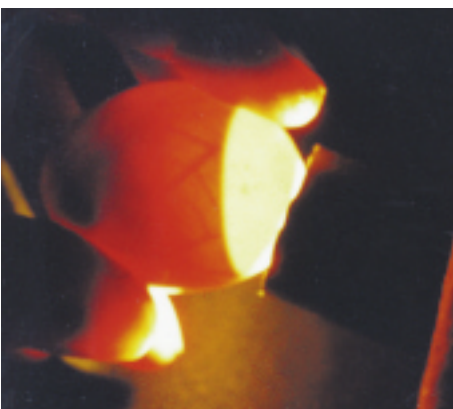
introduction

As a practical parrot breeder, over the last 27 years, it has on many occasions been necessary to incubation eggs and hand rear the resulting offspring. These procedures have been used throughout the world and particularly in the past 10 to 15 years have been perfected to produce better results. Parrot breeding in captivity has increased mainly due to avicultural techniques and an approach which is more scientific than in the past. Surgical sexing has revolutionised the breeding of monomorphic species. Diseases in parrot-like birds have also been revolutionised and a greater understanding of psittasine nutrition has been a major development in the husbandry of parrot like birds. To increase the number of breeding successes, there has been a greater use of artificial or surrogate incubation. Surrogate incubation being the movement of fertile parrot eggs under pigeons or poultry. A substantial amount of data is available via practical experience within PARROTCARE and the breeding successes of various species such as Macaws, Conures, African Greys, Lorys, Love Birds, Australian Parakeets, Cockatoos and Amazons has provided a depth of practical knowledge which may be the equal of most aviculturists in the world.

the egg



An egg, to the uninitiated observer, may seem a simple reproductive method. An egg nevertheless is an extremely complicated structure and contains many intricate parts which collectively enable the egg to hatch through incubation processes. It is, of course, essential that an egg contains all the nutritional requirements necessary to allow a growing chick to hatch, if all these ingredients are not present, then obviously the chick will fail to hatch and the common term 'dead in shell' will prevail. It is therefore important that birds have an adequate diet to ensure that this phenomenon is reduced considerably. As there are adequate descriptions of structure of an egg in other avicultural books, I will not cover the subject here and will concentrate on the practical



aspects of incubation. Parrots lay eggs with no colour, i.e. white. It is generally felt the eggs are white because parrots lay in hollow trees which tend to be dark areas

and she can see the eggs when entering the nest. The egg shell is formed in such a way that it is difficult to enter from the outside but relatively easy to exit for the chick from the inside. The egg shell contains pores that allow moisture and gases to escape. Unfortunately, it is also possible for bacteria to enter through the same pores if the shell goes through a series of cooling. Egg shells also can be accidentally punctured by the hen's nail or cracked by a descending blow when the hen enters the nest. These eggs will invariably fail to hatch as bacteria will enter. The albumen or egg white consists of three proteins. Globulin, mucins and albumen. The egg yolk contains proteins and fats which will be consumed by the growing embryo and will form the main source of nutrition. The embryo begins to develop before the laying of the egg.

From experiences at PARROTCARE it is not necessarily so that larger eggs take longer to incubate than smaller eggs. Our Green Wing and Blue and Gold Macaw eggs take less time to hatch than our African greys and Eclectus. The Macaws take approximately 2 days less than the smaller parrots. From only a few days into incubation it is possible to see the small heart beginning to pump and the cardio-vascular system developing. In week 2 of the incubation cycle blood vessels and veins can be distinctly seen supporting the chick by inspecting the egg through a bright light. As incubation progresses the body of the chick obscures the light while candling and the end of the egg opposite to the egg sac becomes dark and only blood vessels are visible at the air sac end. As the hatching time nears, the chick's head moves towards the air sac. This movement of the chick causes drawdown on one side of the egg. At this time the chick will puncture the air sac and external pipping will be noticed almost immediately after as the egg tooth which is located on the end of the beak punctures the shell. During the whole of the incubation period, it is critical that temperatures and humidity are maintained at the correct levels otherwise variation in hatching times may occur and in cases where they are incorrect will cause either a weak chick at the point of hatch and it may even find the process impossible to achieve. Incubation is the application of heat to an egg which perfects develops of the embryo.. Hens are by far the best at this process and humans have yet to achieve anything like the success rate. We feel it will be a long time before the ideal incubator has been produced.

We have noticed at PARROTCARE that weight gains for chicks brought up by their parents in the nest box are better than those for hand reared chicks, although at the end of the rearing period both chicks tend to be of a similar weight. Success in maintaining parrot-like birds in captivity must be measured by the number of fertile eggs laid and ultimately the number of chicks reared. If the eggs laid are fertile and yet do not hatch then little success has been achieved. The value of incubation and brooding equipment is not the most important aspect of purchasing. Because you spend more does not necessarily mean that you achieve greater success. We at PARROTCARE feel that the procedures outlined in this booklet will assist any aviculturist to increase his overall production of young parrots.



increasing production

The main advantage of artificial incubation is to increase the number of youngsters bred per year. By taking the first clutch between 14 and 21 days it is possible to encourage the parent birds to further lay. This procedure is not cruel, as in the wild often nests of eggs are eaten or destroyed by inclement weather conditions. It is the normal instinct for the parents to continue in their endeavours to raise young. The second clutch of eggs should be left with the parents and the ensuing youngsters also be reared by them. By adopting this method it will ensure that only the strongest and fittest birds are produced and in greater quantities. By allowing parent birds to raise their second clutch there will be a provision for breeding stock into the future. It is our belief that parent reared birds go on to make the more productive pairings in the future. Another important reason for artificial incubation is to save the clutch of eggs that has been deserted by the parent bird. Occasionally a single egg is laid and the hen fails to incubate. There is still a reasonable chance that the egg may be fertile and by artificially incubated a chick is often reared that would otherwise not have been. Avian viruses and disease are less easier transmitted in the hand rearing room and through artificial incubation than is possible when parrots raise their own chicks. It is essential to acquire fertile eggs in the first place to have a male and female in the same aviary. It is surprising how many aviculturists maintain two birds in an aviary simply on the assumption that they are a true pair. It is obviously essential to have birds surgically sexed or chromazone feather sexed to achieve breeding success. Two females will set up home and behave as a true pair even going through the ritual of copulation. Once eggs are laid they will even take turns at incubation. With parrots what you see is not always what you get.

calcium

The next thing you need is a suitable cage or aviary. As this subject has been covered in another booklet by PARROTCARE - Breeding parrots in captivity I will not

dwel on the subject here. Diet and nutrition are also areas covered in the previously mentioned booklet and will also not be covered here in any depth. Safe to say that the only way in which an egg can get the required minerals and vitamins is via the diet of its parents. The parents diet relates directly to hatchability. Calcium in the parents' diet ensure that egg shells are strong and also the bone structure of the chick in such a way as to ensure rickets is not present in the new born youngster. In days gone by, it was believed that sufficient calcium could be derived from cuttle fish bone alone to ensure the breeding birds needs. This is now known to be incorrect and numerous high density liquid calcium products exist on the market. Providing these calcium products are given on a routine basis egg binding should be almost eliminated. Most of these calcium based products also contain Vitamin D3, which is essential for birds kept indoors without their main source of sunlight. Providing these products are administered as prescribed, no danger will be caused to the birds from over-dosing. Relying totally on the parents to incubate and feed their babies through to conclusion is fraught with dangers and therefore it is an insurance policy to own at least one incubator and brooder to cover eventualities in the case of a disaster. There are numerous reasons why a clutch of eggs should be taken from the parent birds. The hen who fails to incubate correctly. This habit sometimes carries on after the first clutch and for some unknown reason she may never be a bird who will sit throughout the incubation period. If regular checks are made of the nest cavity, it may be possible to discern whether eggs are correctly incubated by their temperature. If eggs are found to be cold after the first few days of incubation, then the hen is obviously not sitting correctly. It is worth taking these eggs and placing them in the incubator as even eggs that have been incubated for a short period of time by the hen and then left to cool will still hatch if caught early enough. Parents may break the eggs by either descending too quickly into the nest box or simply eating them. In this case it is possible to put dummy eggs under the parrot until they learn not to break them. It is sometimes easy to forget that birds are on a steep learning curve at this stage in their lives and can be forgiven mistakes, as this is often the way they will learn. Occasionally a parrot may lay an egg directly from the perch and not in the nest box. In my experience this is



usually a one off and more often than not the egg is broken. It is also possible to use other species of parrots who are laying simultaneously to be used as surrogate sitters for those birds that are not able to do it for themselves. Remember it is always better that a parrot should incubate her eggs for the longest period of time possible even if it is the intention to remove the eggs at a later stage. It is not possible to leave eggs under the surrogate parents if they are not in the same breeding cycle chronologically of the pair the eggs have been taken from. For instance, if eggs were to hatch at an earlier stage than anticipated by the sitting hen, she would find it difficult to cope with the situation. Likewise if eggs were about to hatch after her own eggs would normally, the hen may desert the eggs and there would be a subsequent loss of potential chicks. For those parent birds who eat their eggs, it is advisable to check nests just before dark as parrots lay their eggs in the early evening.

seasonal breeders

Some parrots are natural seasonable breeders, i.e. they lay eggs at the same time each year. Those falling into that category are Australian parakeets, Amazons and Cockatoos. Many others are not seasonal breeders for

instance Eclectus and African greys. We have found at PARROTCARE that these birds are capable of laying eggs throughout the year. When removing eggs it is essential that easy access is obtained into the nest box and therefore all nest boxes should be situated in the aviary in such a way that inspections can be done without inconveniencing the parent birds. If every time you require to check the eggs in the nesting cavity you cause major disruption to the breeding pair then you are negating any benefits which may be derived from artificial incubation. Living in the northern part of the UK winters can be extremely cold but I have nevertheless found that eggs left with the parents in nest boxes with the appropriate construction have not come to any harm in temperatures even below zero.

egg laying cycle

The importance of sufficient insulation and construction of nest boxes is critical. It is also important to know precisely

when each egg is laid as the hatching time is totally dependent on this information. Without the guidance of egg laying date confusion can be caused at the stage of hatching in the incubator. Parrots eggs tend to be laid every other day although we have found at PARROTCARE that this is not always the case and there may be a 3 day difference between laying of one egg and the next. Parrots tend to have considerable behavioural changes when they are about to go to nest, often tame birds become extremely aggressive just prior. Obviously the disappearance of the male or female bird into the nest box is a trigger to the nesting cycle. In order to maximise productivity, it is possible to take the first clutch of eggs from the parent birds. This will almost certainly encourage the pair to lay another clutch. In the wild clutches of parrot eggs are often destroyed by snakes, inclement weather conditions, trees being blown over etc. Therefore in the wild state it would be necessary to double clutch to ensure the survival of the species. Another way of increasing productivity is to take the second egg from the nest. The hen will invariably attempt to build up the pre-requisite number of eggs in her clutch by taking eggs up to three or four times it is possible to double the clutch of parrot like birds. A word of caution at this stage. If you persistently attempt to take eggs from the parent bird or remove clutches it is possible for the hen to deteriorate under the strain and also the quality of parrot chicks is reduced and a number of chicks will be bred that are not up to the required standard. The female parrot usually commences to sit on the second egg of a clutch and not at the end of the clutch as it is in other birds. This means you have a progression of chicks usually the first two within a few hours and then others following at 48 to 72 hour intervals. If left in the nest occasionally the youngest chick fails to survive. This is due to the older chicks obtaining all the food available. At PARROTCARE we have found the clutch interval between laying if eggs are taken at about 21 days the cycle is normally in the region of 28 days before the next egg is laid. This is obviously considerably variable and smaller birds like Senegals appear to reclutch earlier than birds the size of Macaws.

I have read some of the most incredible rubbish when it comes to the egg bound female parrot. From using lubricant jellies to assist the hen to lay and using excessive heat. The main reason why a hen becomes

egg bound is because of a lack of calcium and this is the critical factor. If you have followed the procedures outlined in PARROTCARE book on Breeding Parrots in Captivity and your application of a liquid calcium has been a regular feature of your management, then egg binding should be a thing of the past. Female parrots laying their first clutch of eggs are the most vulnerable



and if this has occurred then it is essential to remove the hen from the aviary and bring her into a comfortably warm environment. At that stage it is critical to either give a calcium injection or where liquid calcium is available an eye dropper in the side of the beak is often sufficient to release the egg within a few hours. The reason for egg binding is the lack of calcium in the muscles which expel the egg. The calcium has been drained from this area and used in the egg shell. By replacing this either intravenously or through the walls of the stomach it is possible to put the calcium where it is needed rapidly. If this is not done with some haste the egg laying process may cost the hen her life. Once eggs are removed from the nest it is advisable to candle them immediately to evaluate whether they have fine hairline cracks. If these are noticed it is essential to seal them off at the earliest possible moment. At PARROTCARE we find that a very thin layer of nail varnish will be sufficient to stop air and bacteria entering the egg and therefore causing the eventual death of the developing chick.

All eggs should be handled with clean hands and therefore it is advisable to wash them before any procedures that entail handling. I have heard that sterile rubber gloves should be worn when handling eggs. This never occurs at PARROTCARE. I find it difficult enough to handle eggs safely with bare fingers and thumb without the added disadvantage of gloves. When parrot females incubate their eggs in the wild or nest boxes the egg is obviously heated only on the top by the hen sitting therefore the sides and the bottom of the egg are cool relatively speaking. In the incubator when artificial means are used this is not possible as the temperature of the egg is the same throughout. If the heat in the incubator is distributed via a fan the heat throughout the incubator is evenly distributed. Humidity generated in the wild and in nest boxes is also an important factor in hatchability and this must be simulated in the incubator to provide similar conditions. When you are removing the eggs from the nest box to the incubator it is important that you carry them in an appropriate container, one containing either wood shavings or small seeds ensures that eggs are not bumped together while being moved.

At PARROTCARE we immediately candle the eggs prior to putting into the incubator to establish the oldest egg from the youngest and also mark the eggs with an HB pencil in order of final hatching. At this stage we also check for cracks or holes in the eggs and do the necessary repairs. Parrot eggs have a greater success of hatching if left for a minimum of 10 days or more with the parents. I prefer a period of up to 21 days if this is achievable.

At PARROTCARE we have three incubators. No.1 is the main incubator. No.2 has been adjusted for larger eggs such as Macaws and the third incubator doubles up as a hatcher. These machines are left running 24 hours per day, 52 weeks per year. It is also possible to have varying degrees of humidity in each of the incubators. The three incubators are of the same model - Matador Professional. I have made many modifications to the basic box, but things I like most about them is the all



round visibility and their ability to maintain accurate temperatures. I personally have little faith in digital thermometers and prefer the old fashioned mercury variety. As the majority of the box is unused I find that by placing the mercury thermometer directly above the eggs being incubated I get an extremely accurate reflection of the temperature. Even mercury thermometers of a medium evaluation can be inaccurate up to $1/2^{\circ}$. If this inaccuracy is allowed to continue over a period of days then it will affect the hatchability of the eggs. It is therefore important to have at least one thermometer which is calibrated and reliable in terms of temperature. It is possible then to calibrate other mercury thermometers from this one by indicating a + or - inaccuracy. The incubator is also a moving tray. This means that the egg is rolled across a metal tray by steel wires attached to a motor. A minimum number of turns within a 24 hour cycle is in my view 48. In addition to these turns it is also advisable to rotate the egg by 180 degrees two or three times a day. At PARROTCARE we adopt this procedure as a matter of routine. In the event of a power failure, thankfully this has not occurred at PARROTCARE yet, we nevertheless have on hand hot water bottles which can be filled and wrapped with a towel and eggs could be laid on these in an attempt to maintain temperatures

of approx. 100o F which will keep the eggs alive while the power is restored. Whilst this procedure is being followed take great care to ensure that eggs are not damaged. To reduce the overall vibration in the incubator cabinet it is advisable to have them situated on solid tables as low down to the floor as possible. It is amazing how easy it is to knock a table while passing and subsequently destroying the eggs. Even small continuous vibrations on unstable surfaces can cause a reduction in hatchability. The floors in our incubation room are solid and the benches on which the incubators are placed are relatively low down which allows easy viewing of the eggs as well as reduction in vibration. The incubator which has been modified to use as a hatcher has merely had the bars removed and additional humidity can be applied to the egg by flooding the floor area. Cleanliness of incubators and hatchers is essential.

At PARROTCARE we use a prepared diluted disinfectant which is ideal for this purpose. Whenever the incubator is empty disinfecting takes place before any new eggs



are placed in it. Routine maintenance is also an area not to be neglected. If a motor begins to sound the worse for wear take the precaution of having sufficient spares to ensure the incubator will continue to function in the event of an emergency. The benefits of sticking with one type of incubator when purchasing a number of units is that spares and parts are interchangeable thus ensuring that in a crisis you can still maintain at least one or two incubators in working condition while the third is being repaired.

The ambient temperature in the incubation room is

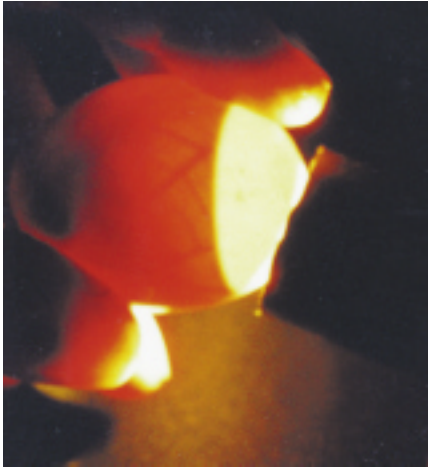
critical and must be maintained at a stable level otherwise the equipment in the room will find it difficult if not impossible to maintain accurate temperatures. An example would be a room in which direct sunlight is able to penetrate and therefore cause wild fluctuations in the temperature. An ideal room for incubation purposes is a one without windows and protected from direct sunlight by another larger building. An example of an ideal incubation room would be a cellar or air conditioned room where the temperature could be maintained within a degree and therefore have the least temperature fluctuations that may affect the incubator. I have spoken to a number of parrot enthusiasts who believe their incubator is at fault due to its inability to maintain temperatures only when having a thorough discussion is it realised that the problem is not the incubator but the high fluctuations in ambient temperature in the room in which it is kept.

Good cleanliness practices should be enforced in the hand rearing and incubation room. It is essential that viruses, fungus and other bacterial are not brought into the room by shoes and clothing which have been worn elsewhere. All equipment used in the incubation room should be disinfected and sanitised daily and all equipment which will come into direct contact with a chick or an egg should be sterilised after each procedure. The equipment I find indispensable in the incubation and hand rearing room are:

tweezers	small scissors	torch
HB pencil	wound and skin cleaner	cotton buds
candler	nail varnish,	small microwave
spotlight	swivel chair on castors	paper towels
scales	various sizes of needles	infra red heat lamp
cups	spoons various sizes	

candling

Candling and repairing eggs is an important part of incubation procedure. As I have already mentioned, eggs should be candled immediately after removal from the nest. By doing this, you become aware of any eggs which are dead in shell, clear and at what stage incubation has progressed. If you are unsure as to when the first egg is laid it is critical to identify an approximate age of the eggs at this stage and number the eggs in order of age. They are then placed in the incubator so that they can be visually identified in age. Any cracked eggs are made good at this point. As I have mentioned clear nail varnish has been used at PARROTCARE to good effect. A pair of Eleanora's Cockatoos in our care break eggs routinely. Fortunately, these are usually hairline and if removed early enough and repaired the eggs will continue to progress and eventually hatch. Remember whenever varnish is placed on an egg that area will be less porous than the remainder of the egg and therefore if large areas are covered in varnish the chick is unable to reduce its water content at the necessary rate. Also if repairs have taken place over the area where the egg would normally pip and the chick rotate then an aided hatching will be required. Therefore any eggs that have been repaired cause a greater risk to



hatching. Candling an egg can tell an experienced aviculturist a lot about the progress of the chick. A critical time is at drawdown. If the age of an egg is unknown it is worthwhile drawing a fine pencil line around the visible joint of the air sac and the membrane.

This line can be clearly seen when candling. By doing this any drawdown which takes place over a number of days can be seen by the observer. Once the speed of drawdown

increases it is essential to remove the egg from the incubator and place in the hatcher. If this is not done and the egg is allowed to rotate while drawing down and pipping the results will be disastrous and the chick will die. At PARROTCARE we always put a small needle hole in the egg shell to relieve any pressure build up that may have occurred during incubation. This procedure is done with a disinfected needle which is proportionate in size to the egg. The hole must obviously be in the air sac otherwise anywhere else on the egg and the chick would die. The egg is then laid on a flat smooth surface and allowed to find its own centre of gravity. Once this has been achieved the egg is laid on tissue in a ceramic bowl and placed in the hatcher. Within 24 hours the chick should have pipped internally on the membrane and almost simultaneously internally pipped the egg shell. The temperature in the hatcher should be approx. .5°C or 1oF less than the temperature in the incubator.

incubator temperatures

The correct temperature for incubating parrot eggs is 37.5oC. A temperature fractionally lower than this say 37.2 oC would be considerably safer than a higher temperature. Any temperatures above 37.5°C are considerably more dangerous than lower temperatures.

At PARROTCARE we have a dozen or more mercury thermometers. By trial and error I have established a control thermometer, from which all other thermometers are calibrated. Even the most accurate and expensive mercury thermometers can be out by up to about 1/2° which can cause the eventual failure of the egg during incubation. I have modified the incubators at PARROTCARE to ensure that the thermometer is directly above any egg being incubated. Maybe I am old fashioned, but I do not trust digital thermometers for this task. Whenever in the incubation room the first job is to check temperatures in both incubators and hatchers for accuracy. Any changes from the norm are registered and rectified. A temperature of say 38°C, i.e. 1/2° higher than is recommended, will not kill the embryo immediately, but eventually weaken the embryo where it will fail to hatch or die. A lower temperature can be rectified provided it is noticed within 2 days of the problem occurring. Changes in temperature during the first part

of incubation are often more critical than in the latter stages. It is therefore recommended to leave any eggs with the parents for at least 21 days if possible. In the early stages of incubating eggs at PARROTCARE I used to routinely sterilise all eggs. I have ceased to do this in the past 10 years as on one occasion I am sure that the embryos were destroyed by the disinfectant. Once an egg is disinfected, it has no resistance to the entry of bacteria or fungus. I would not recommend the disinfection of parrot's eggs and prefer to leave them with the natural resistance which has been built in by the hen.

At this stage it is worth mentioning that whenever you set up an incubation and hand rearing room it is based on the approximate number of eggs and chicks which you anticipate breeding in one year. If you find that the volume of eggs and chicks is doubled during that period of time, the set up is normally only capable of efficiently processing the estimated number. It is at this stage then that infection and bacteria can take hold in the incubation room and therefore any overloading of the system must be compensated by rigorous disinfection and cleaning of the area on a regular daily basis.

turning eggs

There is a general impression that providing eggs are turned approximately once per hour throughout the day and night they will eventually hatch. We have found at PARROTCARE that the advisable number of turns required by a parrot egg in a 24 hour cycle is nearer 48. If your incubator will only turn the eggs at a lesser rate than this, it would be advisable to turn the eggs manually a number of times each day. As a rule of thumb, if the turning is correct in the incubator then eggs should have complete vein coverage at about 60% of the duration of the incubation period. As parrot eggs are easily candled, it is possible to monitor vein coverage throughout all stages of the incubation.

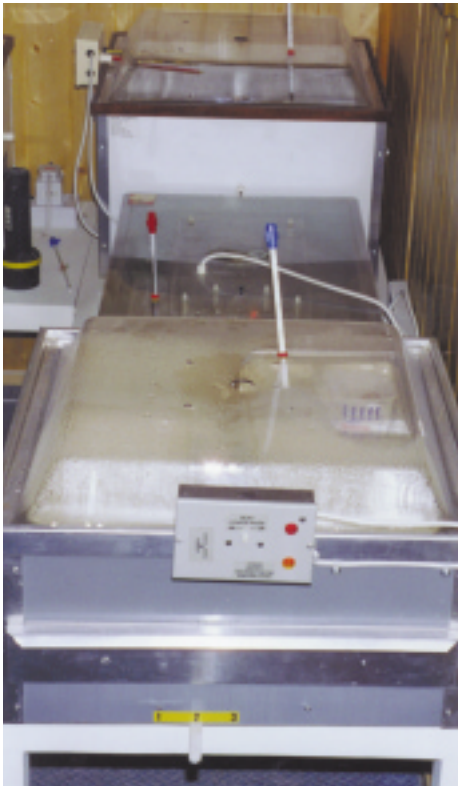
cool eggs

If eggs are checked in the nest box and found to be cool to the touch, it will obviously be essential to place them in the incubator for them to progress further. Under no circumstances should a cool egg be placed immediately into an incubator at 37.5°C. This may cause a sudden shock to the system of the embryo and eventually cause death. It is better to take the egg temperature up in stages over an hour or two. This can be done by placing the egg in a brooder that has a temperature of say 25-30°C then gradually move it up to the required incubation temperature. This procedure is particularly applicable to eggs that have just been laid in the nest but found to be cool.

the hatcher

As already mentioned, the hatcher is a Matador incubator with the turning mechanism removed or Octagon 20 in conjunction with the parrot rearing module. A calibrated

thermometer is placed directly above the hatching egg, which has been placed in a ceramic bowl with tissue to rest on. The hatcher is flooded to ensure humidity is increased to over 80%. Prior to placing the egg into the hatcher ensure that it's natural centre of gravity is allowed to take place. This can be done by placing the egg on a smooth surface and allowing it to naturally turn until the chick's body weight is at the bottom of the egg. Over the next 24-48 hours the chick's centre of gravity will change again slightly and it will be necessary to follow the aforementioned procedure again. Providing the chick is healthy within 48 hours a new chick will emerge from the egg. It is at this time when the breeder may become anxious and feel that the chick is not capable of extracating itself from the egg. Be patient, it's amazing how 90%+ of all eggs are capable of going through this procedure unaided. Once hatching actually begins and the chick rotates in a clockwise direction the



whole procedure can take as little as 15 minutes to chip off the top of the egg and emerge. Occasionally, a chick will pip on the wrong side of the egg, i.e. the opposite side to the air sac. This indicates that the chick is upside down. It is not necessary to panic in these situations, as more often than not the chick is perfectly healthy and will require some assistance to hatch. The equipment needed to assist such a hatch is a high humidity hatcher without the forced air. Forced air hatchers will dry out any membrane that has been opened up by removing the shell over the air sac. Once the membrane has dried out, it is almost impossible for the chick to force its way out. The equipment I use for

this purpose is a Curfew 105 High Humidity hatcher. The malpositioned chick must be allowed to take in air through the small puncture hole on the incorrect side of the egg which it has made. To allow this to happen it may be necessary to slightly enlarge the hole. Great care must be taken at this stage as blood vessels will still exist around the chick. This procedure is normally done with a very small pair of tweezers and a sterilised needle. Place the egg back in the ceramic bowl with tissue ensuring that the egg is allowed to centralise and maintain its centre of gravity. At this stage remove the egg shell over the air sac to expose the membrane. By delicately using a small paintbrush and sterilised water, preferably warm, it will be possible to put a small quantity of water on the membrane and this will make any blood vessels easier to see. As long as blood vessels are evident in the membrane the chick is not ready to hatch. With a malformed chick, such as one

described, the feet of the chick are usually just under the exposed membrane. Once the blood vessels have disappeared and the chick is ready to hatch it normally punctures the membrane with a foot. It will then be possible to help the chick from the egg, but do not attempt this procedure until all blood vessels have subsided. Over the years we have had a number of chicks at PARROTCARE with this problem and all have been successfully hatched and reared. I do believe that had these eggs been left in the nest they would have been unable to hatch themselves.

disinfecting the chick

Immediately the chick has hatched, it will be necessary to remove it from the hatcher and disinfect the navel area. It is essential to follow this procedure as the navel area is the most likely place for bacteria to enter the chick at this early stage. I do this with cotton buds that have been sterilised with boiling water before allowing to cool down and disinfectant administered to the chick's navel. It is essential to be extremely gentle at this stage as any undue pressure in this area could cause serious problems for the chick. The chick is then immediately placed into a high humidity brooder (not forced air) at 37 °C for the first 7-8 hours.

As a rule of thumb, I follow the temperatures outlined below from hatching through to eventual independence.

Days	Temperature
0 - 6 hours	37°C
6 hours - 4/5 days	36.5°C
4/5 days - 14/15 days	35°C
14/15 days - substantial chick feathering i.e. not to be regarded as naked babies	34°C
Lowering the temperature gradually until the chick is placed in a play pen with heated floor at about 25°C	25°C

introduction to hand rearing

Domestic production of hand reared baby parrots will become more important as the importation of wild caught birds draws to a conclusion. Current legislation and deforestation of natural habitat will eventually cause the complete cessation of imported parrots. More and more pet shops and parrot owners will come to rely on the breeder and hand rearer to provide pet parrots in the future.

Two methods are currently available to aviculturists for increasing production. One is to remove eggs from the nest and artificially incubate, the other is to remove chicks from the nest at an early age for hand rearing. Both of the above methods will ensure that the parent birds continue in their breeding cycle and therefore increase the overall production. Hand reared parrots make far superior pets to wild caught birds. This is due

to the activity of imprinting when hand reared birds become completely humanised. The bonding that takes place between a pet parrot and its owner can be life long and the experience extremely rewarding.

the nursery

Offspring by their parents in the nest often show a greater level of disease than those babies that are hand reared. It is generally accepted that hand reared babies do not make the best parents in the future and if that is the aim then parent reared parrots should be purchased. When first setting up the nursery one must consider the overall number of chicks anticipated to be reared in



that environment during a 12 month period. Peaks and troughs will take place where on occasions very few babies are being hand reared and during the peak of breeding activities the largest number will be in the brooders. Only the largest establishments hand rear in excess of 40 chicks per year. Therefore the level of production this book anticipates is probably something in the order of 10-15 chicks in the hand rearing room at any one time. If over-production is attempted in a limited nursery then disease and other health problems will increase significantly. If it is anticipated that your nursery will accommodate chicks of 2-3 weeks old and on over, then the requirement for sophisticated equipment and the length of time spent in the bird room will be reduced significantly. For the sake of the text in this booklet, we will assume that chicks are to be hand reared from day olds that have previously been eggs incubated in the bird room.

designing a nursery

If, for instance, a small number of chicks are to be hand reared maybe two or three times a year, then the corner of the kitchen or some other utility room in the house may be available. If a larger number of chicks are to be considered, then a separate room entirely would be the

ideal operation.

Chicks of a day old require numerous feeds per day and therefore the location of the room should be in close proximity to the normal living area. All items required should be close at hand and not to be searched for whenever required. It is important that pets and small children should be banned from the hand rearing room because of the havoc they can create.

brooder temperatures

As previously mentioned brooder temperatures are critical particularly in the early stages of a chick's life. From 1-14 days old, temperatures must be between 37°C and 35°C. If chicks have been raised by the parent's for the first 2-3 weeks, then initial brooder temperatures once removed from the nest will be approximately 31°C. As can be seen from the variation of the temperatures, chicks fed by their parents in an outdoor environment become acclimatised to lower temperatures much more quickly than do incubator hatched chicks. At PARROT-CARE we still believe that it is necessary to have a professionally manufactured brooder to ensure chick survival even from the age of 2-3 weeks. Home made devices are not advisable where the life of a parrot chick is at stake. Some of the items you will require for the hand rearing room are listed below:-

Medical supplies	Hand feeding equipment
Kitchen tissues	Finer tissues
Cups	Feeding instruments
Food bowls	Cages
Veterinarian and avicultural medical supplies	Antibiotics
Anti-fungals	Probiotics
Bedding materials	Brooding containers
Microwave	Heat lamp
Clean water	Refrigerator
	Air tight containers

cleanliness

It can never be overstressed the importance of cleanliness in the hand rearing area. Chicks at an early stage are extremely susceptible to diseases, viruses, bacteria and fungi. Bedding in the brooder container must be changed at every feed and at PARROTCARE we use paper tissues as bedding. For the first few years of hand rearing, we used microwaved and sterilised wood shavings for this task. Over the past few years we have ceased this practice and now only use paper tissues. We had the unfortunate occurrence where a chick attempted to swallow the wood shavings and although survived the ordeal we felt it was too risky to continue with that practice.

A nursery should be a well ventilated area and at least one major extractor fan should be situated in the room, which ensures a turnover of air at least twice per day. In climates where high temperatures occur air conditioning and air filtration systems will be required to maintain air conditions at acceptable levels. Ionisers are also in use at PARROTCARE to reduce the level of dust in air.

mortality rates

It would be true to say that mortality rates amongst chicks hatched from the egg should not exceed one or two in a hundred. If deaths in the hand rearing room exceed this number then they must be regarded as suspicious. Very few parrot babies die suddenly in the hand rearing room unless by accidents caused by choking on formula or accidental death by physical injury i.e. dropping the chick. Prior to any chick's death, there is a period when it is possible to identify problems are occurring and therefore urgent action is needed to rectify whatever the problem is. The main areas to check are cleanliness of spoons, cups, brooders and chick containers, humidity and the level of bacteria that may build up in water used in the brooder, the temperature and viscosity of the hand rearing formula, temperatures in the brooder which should relate to the chick's age.

Chick colouration is a direct indicator of health. Healthy chicks should have a pinky look about them and any signs of pallor could be regarded as unacceptable and a sign of ill health. Weight gain is also important. A parrot chick should increase in weight by approx. 20% over day over the first 2-3 weeks.

Whenever brooders, hatchers are not being used they must be immediately disinfected for any new chicks to enter. It is fatal to continue to use a brooder throughout the breeding season without disinfecting regularly. Commercial products are available which can reduce the level of bacteria which may be prevalent in water used for brooders in connection with air humidity. Remember if you are to disinfect the hand rearing room and its contents, you must be extremely careful that any chemicals, pesticides or disinfectants do not cause the death of any chicks. While performing any disinfecting tasks of hatchers and brooders it is often wise to remove them from the hand rearing room. If the hand rearing room is to be disinfected then a good circulation of air is required. A large selection of commercially available disinfectants are specially manufactured for this task.

chick identification

In most cases, where limited numbers of parrot chicks are hand reared, it will be unnecessary to identify chicks, as this information will be readily contained in the breeder's head. In larger more commercial operations, it will be necessary to identify chicks for blood line. This can be done by felt pen in different colours and the use of plastic leg rings, which are expandable throughout the life of the chick. Once independent, these leg rings can be removed. Parrot chicks can be close rung at between 2/3 weeks and these rings can be obtained from the Parrot Society or commercial



organisations. Parrots because of the variety in size have numerous leg rings available. It is obviously critical that only the appropriate leg ring should be placed on the bird. If an incorrect steel leg ring were to be placed on a chick then at a later stage in life when the leg grows it could cause to stop the circulation to the foot and therefore require removal. The following is the UK Parrot Society recommended size for various parrots.

Variety of Bird	Close ring size
Grass parrots Parakeets Love birds Kakariki Many coloured Red Rump Stanley Rosella	L/M
Cockateels Larger Rosellas Pileated Smaller Conures Smaller Lorys	N
Port Lincolns POWs Barrabands Cloncurries Pennants Dusky and Perfect Lorikeets Slatey Headed Conures Sun Red Bellied Nanday Jendaya Blue Throated Conures Quakers	P
Crimson Wings Chattering Lorys Mayers Plum Heads Red Throated Conures Red Bellied Rock Peblers Senegals	R

Ring necks **S**
 Moustached
 Black Headed Caiques
 Australian and Green Winged Kings
 Hahn's and Noble Macaws
 Lesser Patagonian Conures

Roseate Cockatoos **T**
 Blue Naped Parrots
 Blue Headed and Bronze winged Pinonus
 Yellow Naped Macaws
 Queen of Bavarias and
 Greater Patagonia Conures
 Alexandrians
 Jardines

Citron and Lesser Sulphur Crested **U**
 Great Billed and Hawk head Parrots
 Yellow Billed
 Cuban
 Hispaniolian
 Green Cheat and Orange Winged Amazons

Black Palm **V**
 Medium Sulphur Crested and
 Umbrella Cockatoos
 Eclectus
 African Greys
 Chestnut fronted Macaws
 Yellow naped St Vincent
 Blue fronted
 Panama and Double Yellow headed Amazons

Greater Sulphur and **W**
 Moluccan Cockatoos
 Military Caninde
 Green wing and Scarlet Macaws

Hyancine Macaws **Y**



keeping records

If you have not kept records of your breeding results, as the years go by it becomes more confusing as to which bird was bred from which pair. With relatively little effort it is possible to track the birds from breeding pair,

through the hand rearing process and to the parrot's eventual owner. Information can be kept in either hard copy, i.e. in booklet form, or on a computer.

type of brooder

At PARROTCARE we have used many types of brooders over the past 20 years, some were hand made by us and others are commercially purchased. At PARROTCARE we use CURFEW incubators and these have been extremely satisfactory over the past decade. CURFEW are capable of maintaining temperatures at the required tolerance and are easily dismantled to ensure cleanliness is at the highest level. The heat source within the brooder we have found at PARROTCARE to be extremely important. We once purchased a brooder with top heat in the lid and this unit proved extremely troublesome as chick development was extremely poor and in some cases caused the eventual death of the baby. This unit has been discarded at PARROTCARE but is still in commercial operation in the UK. The correct advice initially when purchasing a brooder can be critical at a later stage.

brooding

0-6 hours

The temperature maintained at this critical time is 1/2° below the incubation temperature at 37°C. No food is required during this period as the chick is still being provided with food from the yolk sac. After this time the first feed of water and commercially produced bacteria is introduced to the chick. The bacteria kick starts the crop and commercially prepared formula contains this ingredient.

The first 5 days

During this period of time it is essential to brood chicks individually. This will assist the hand rearer to identify problems with an individual at an earlier stage than if they were brooded collectively in one bowl.

5 days to 14 days

Temperatures of 35°C are normally adequate during this period of time. A practical way to check the temperature of a chick is to place the very tip of its wing between your lips, if they feel cold then obviously the temperature is too low. Chicks being brooded with nest mates can often tolerate slightly lower temperatures because of heat generated between them. Babies are more content when brooded with nest mates. At this stage, the container must be increased in size to allow chicks the ability to move away from their nest mates and adjust the temperature to their needs.

14 days to substantially feathering

At PARROTCARE the temperature is lowered to approx. 34°C at this time in the chick's life. This temperature will be slowly lowered until the chicks are feathered on both and wing and head. At this time they are able to maintain their own temperature due to their feather insulation.

Full wing feathers

At this stage, 25 oC underfloor heating is adequate. At PARROTCARE all chicks are placed in a play pen at this stage and allowed access to food. Throughout all stages of hand feeding the formula is gradually thickened up whilst ensuring the food is clearing the crop. A mistake often made is to feed chicks too thin a formula over the early stages of its life and if this is taken to the extreme the chick may die of malnutrition. All baby parrots at PARROTCARE are weaned directly onto a complete diet. This ensures that adequate nutrition is available throughout the early stages of a chick's life. At a later stage, additional fruit and vegetables diced can be placed in a separate bowl and added to the baby's diet.

Transfer to a cage

Once the baby is perching adequately and sampling pellets, it is transferred to a cage to simulate its future environment. Perches are placed low with food bowls easily accessible at each end and directly in front of the bird at the same level as the perch. Pellets are easily accepted and produce little waste. If the temperature does drop in the weaning area, chick heat can be supplemented via an infra red lamp. Cages in which baby parrots are weaned should have wire floors to ensure that any faeces or leftover food drops in an area inaccessible to the chick.



formulas

In the early years at PARROTCARE we always mixed our own formula from the following recipe:-

- Haiths Necta blend
25%
- Haiths PTX Budgie
Rearing food
25%
- Malupa fruit
25%
- Malupa vegetable
25%

Added to the above a good quality mineral and vitamin solution. At about 4 weeks of age we added crushed whole

sunflower seed. At PARROTCARE we found this diet to be more than adequate and I can not recall losing a chick because of nutritional deficiencies. For the past 10 years we have used a prepared hand rearing formula as it is a lot more convenient than mixing your own and also tremendous levels of scientific research have been entered into in the preparation of these products to ensure all the dietary needs of different types of parrots are catered for. It is possible now to purchase a formula which specifically caters for the needs of Macaws and Eclectus and a second formula which is adequate for all other types of parrot.

Care must be taken to mix formula as per manufacturer's instructions. Too thin and it can cause a retarded chick and malnutrition, too thick and it may find difficulty passing through the crop. Describing the correct consistency for formula can be quite difficult but, suffice to say it should be thick enough to flow off the spoon when the chick is begging.

We never reheat or reuse formula once the end of a feed arrives. All food leftover is discarded and all feeding utensils sterilised.



temperature of food

This is an important issue and if the food is fed too cold the chick may choke on the contents of the spoon as it attempts to reject the formula. A method which we use at PARROTCARE is to check the temperature of the food with the lips. If the food feels the right temperature to you then it is the right temperature for the chick. In the early stages of a chick's life the temperature of the food is more important than in later life. A chick will take coolish food from a warm spoon as it can feel the heat from the spoon. When feeding very young chicks it is important to dip the spoon into warm water to maintain its temperature throughout the feeding period. The smallest spoon possible is used over the first week or so. Spoons are modified by turning in each side to provide a funnel leading to a narrow point at the end. Spoons should be made from the finest material possible and at PARROTCARE we have always found the old fashioned tiny silver spoons to be perfect for the task. As the chick grows older, the spoon is increased in size to hold extra formula. Food that is too hot is far more dangerous than food that is too cold. Unfortunately, we have heard of chicks dying with burnt crops.

the digestive system

Lactobacillus is an important ingredient in commercially produced hand rearing formulas. Additional lactobacillus can be purchased separately and added to any formula when it will be most appreciated at the beginning of the chick's life. Lactobacillus provides good bacteria which enables the food to be digested more readily. If negative bacteria enters the crop, then this can cause illness and may have to be treated through antibiotics. It is essential to ensure that good bacteria enters the crop at the earliest possible stage, and therefore the first feed should contain a high level of lactobacillus.

other forms of feeding instruments

At PARROTCARE we have tried to use various syringes over the years and found them to be inadequate. Only the use of spoons are acceptable to us as this gives us the opportunity for the chick to taste the food and spend more time with the carer. Other feeding utensils are catheter tubes, galvanised needles, eye droppers, bulb and piston syringes. Some of the aforementioned instruments are positively barbaric and we feel at PARROTCARE they are inadequate for the feeding of baby parrots.

day old chicks

For the beginner, feeding a day old chick can be a daunting experience. For such a tiny bird the feeding response is often vigorous and may take the inexperienced hand feeder by surprise. Very small feeding implements are required and although we use the smallest available spoons at PARROTCARE, an eye dropper will do a similar job while the feeding formula is watery. It is very important to be in control of a situation and to do so feeding should take place at eye level and under a high intensity light to ensure that your vision of the chick feeding is unimpaired. If the hand rearing room is cool, then it may be necessary to employ an infra red heating lamp to ensure the day old chick does not chill while feeding takes place. Our hand rearing room is maintained at 20 oC and additional heating under these circumstances is not necessary. Normally it takes up to 7 or 8 hours for a chick to absorb the yolk which remains in the abdomen. If warm water is fed during the first few hours, this fecal matter will be passed. It is important over the first few days to ensure crop is stretched slightly at each feed to ensure sufficient formula can be placed in it to provide the chick with adequate nutrition. Ideally, the crop should not be empty at the next feed. The danger of a chick aspirating on liquids when being hand fed is a real one and great caution must be taken to ensure that the chick is consuming food at the same rate it is passing formula into its crop. If this precaution is not taken the fluid diet may fill the chick's mouth and cause fluid to be ingested into the lungs. When feeding a very young chick the head should be supported between the thumb and forefinger to ensure that it does not drop and cause the fluid in the crop to enter the bird's throat and therefore cause asphyxiation. At this age, each chick is placed in a separate bowl which provides the chick with support and enables it to sit upright in the bowl. If the chick is allowed to lie flat then there is always a chance that crop fluids may be regurgitated. In the first few days the crop empties very rapidly and the chick may need feeding every two hours. An overnight rest from feeding does neither the chick nor the carer any harm and a period of about 7 hours of rest for the digestive system of the chick is not harmful and may have a beneficial effect. If while feeding the chick the head jerking response ceases and formula still remains in the mouth, it is advisable to cease feeding

and put slight pressure on either side of the upper mandible to evoke the head jerking activity and vocalisation again. This is a method used at PARROTCARE to ensure asphyxiation does not occur. For the novice, it is worth practising this response by trial and error of varying pressures on the upper mandible. This can be done without the use of food and will provide the novice with a gauge of the necessary pressure to acquire the head jerking activity.

Remember feeding very small chicks is not a race and it is important to take as much time as necessary to make it work as excessive speed will inevitably cause a disaster.

The temperature of food should be the approximate body temperature of the chick which is around 100°F. As previously mentioned, if the temperature appears to be okay when passed to the human lips, then that is a satisfactory measure of whether it will be warm enough for the parrot baby.

When mixing formula with water, if it is left for a few moments it tends to become thicker the longer it stands. There may be a necessity to add additional warm water to get the food back to the required consistency. After the first week or so the chick will require a much thicker formula as the level of nourishment for growth is increasing. After 3 or 4 weeks the food may be at the consistency of apple sauce to provide the correct nutritional levels. The entrance to the bird's crop is normally down the right hand side of the bird's neck. This entrance is called the oesophagus. Therefore it is important to feed the bird via the left hand side of the beak with the spoon facing towards the oesophagus on the right hand side of the bird's neck. This ensures an easy flow of formula from the spoon directly into the bird's crop. If the reverse action is taken and the bird was fed from the right hand side the food would basically go around the mouth before it could enter the oesophagus.

weight gains in hand reared chicks

There is no reliable evidence that weight gain charts can be relied on as the true development of a "normal" chick. It is better to be concerned with the general health and growth of the chick rather than precise weight comparisons between hand reared babies that has been raised by some mythical person who supposedly has produced a weight gain chart. A classical example of normal weight gain is a chick parent reared against a chick hand reared at the same age will be vastly different. The parent reared chick will be substantially heavier and give the appearance of a greater development than the hand reared chick. This is how nature works and there is no getting away from the fact that the parents will always do a better job than the hand rearer. The important thing whilst hand rearing any type of bird is if the chick is showing good hydration levels, good colour and maintaining a plump and round appearance and weight is greater than the previous day, then you can be sure its

development is normal. If during physical examination a chick appears to be normal, it is of greater value than weight data. It is surprising that at the end of the hand rearing exercise and the chick is fully weaned and on the perch, it will have achieved the target weight and size if the procedures described have been adhered to.

problem solving

There are many problems that can occur in the hand rearing room most of which can be put down to poor management practices. Problems are legion and too



many to mention in a small booklet such as this. Going back to one of my opening remarks on hand rearing, very few chicks should perish during the hand rearing procedure even from day old and should be no more than 2-3%. If the procedures outlined in this booklet are adhered to, then problems requiring medical attention should be few and far between. If viral or bacterial infections invade the chick, then there is very little the hand rearer can do to cure it. Prevention is far better than cure and a very detailed management plan should be put into effect and adhered to.

weaning

Once your baby parrot has reached this stage the job is almost complete. The most amazing stories have been heard about weaning but at PARROTCARE there have

never been any major problems weaning the baby parrot onto hard food. I am now of the firm belief that weaning onto a formulated complete diet or pellet is the easiest and most successful way of weaning the baby parrot. The colourful nature of the pellets and their crunchiness appears to attract the baby and although this starts as play it soon ends up with the bird being fully weaned. It is possible to buy interim or weaning diets that are produced for that express purpose. You can not starve a baby parrot into submission when it comes to becoming independent. At PARROTCARE we continue to feed the baby until it no longer requires the food from either a psychological or nutritional standpoint. By simply feeling the bird's crop it is possible to establish whether it is feeding correctly.



Over the past 20 years we have tried every weaning trick available. Lorys are by far the easiest of all parrots to wean. The weaning process can take as little as one day as food is consumed in liquid form, merely introducing the lory to the liquid diet warmed up is sufficient. It is often a good idea to put the spoon in the nectar and the bird is clever enough to put two and two together and realise that simply playing about the spoon is sufficient to encourage eating and drinking.

Much more difficult are the larger parrots, Eclectus and Macaws will allow you to hand feed them for as long as you want, even though they are totally independent in terms of food consumption. They often continue to beg for food from the hand rearer whenever he enters the room. Strangely enough when a person who is not the hand rearer enters the room the begging ceases, proving the need for food is psychosomatic and not nutritional. It is important to know the difference. As mentioned previously we now wean all babies onto the complete diet, with the addition of fruit and vegetables in a second bowl. At PARROTCARE we have found this to be easily the quickest and most satisfactory way of weaning.

The number of unweaned chicks finding their way onto the pet market is quite alarming and at PARROTCARE it is a policy not to allow any parrot to leave the premises for at least 10-14 days after we feel it is totally independent and feeding himself. Purchasing a parrot that is not properly weaned can be an extremely traumatic experience for both owner and parrot. The parrot may not survive the ordeal.

Throughout the weaning process for all parrots, there is a weight loss probably in the region of 10%. The baby will tell you when it does not require any further food. If



an attempt is made to feed a weaned baby then it may start initially to take food but very quickly turns its head away. This is a sure sign that the weaning process is complete. Never allow a baby to retire for the evening without food in its crop. A little food at this time will only have a beneficial effect.

There are positives and negatives in producing imprinted parrots. On the plus side any hand reared parrot is gentle and humanised and experiences no stress in the company of human beings. At PARROTCARE we believe that hand reared babies particularly in species such as Cockatoos and Macaws do not make good breeding stock, being completely imprinted on their human owner. Other parrots such as African Grays, Amazons and

Eclectus, if associated with other of their own species at an early stage in their lives accept the other parrot and will eventually go on to breed.

conclusion

If the information gleaned from this booklet assists in any way, the propagation of parrots that are currently, or may in the future, be endangered in their natural habitat and increase the overall numbers, then it will have fulfilled one aim. The second aim is to produce well adjusted tame and sociable birds that will interact with their owners to provide a fulfilling life for both parrots and their human companions.



parrot*care*

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