Hand Rearing Birds

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Hand rearing birds: why?

There are several reason why people hand rear birds. Sometimes it is the simple "taste of a challenge"; or one can be worried to lose a very special bird. Sometimes it is a commercial need (to have more chicks to sell). Finally, it may depend on specific needs (for example one owns bird pairs that are good egg producers, but do not raise chicks successfully). In most cases people do hand rear chicks for a blend of all these possible facts. Anyway, even if hand rearing will help fixing some problems, if it is not well planed it will for sure lead to different ones.

This means that all what concerns your nursery, or Baby Station must be thoroughly planed and organized in detail.

Veterinarians, even experienced Avian vets, do not necessarily know how a large nursery works. Often an avian veterinarian receives pet birds, or breeding birds, or sick chicks from a nursery, but never, or rarely has the chance to be involved in the daily routine of a breeding centre.

Things one must take into consideration are:

ENVIRONMENT

This is fundamentally important. Not only because it is the place where chicks are, but also because people will work there (including the veterinarian).

- Rooms: if we do not count the rooms for incubation and hatching, then we need at least three rooms (quarantine, young chicks, older chicks). But ideally we want to have two separate environments:
    - a "quarantine" environment, for "dirty", or "suspect" chicks coming from the nests,
    - a "clean" environment, for the chicks coming from artificial incubation.

The "quarantine" portion of the nursery will include two small quarantine rooms, and a large and warm room for the older chicks.

The “clean” portion of the nursery is easier to organize, and will include only two large and warm rooms for the chicks of different age.

Obviously, as the young chicks are approaching weaning, they need flying cages, or aviaries, where they can strengthen their muscles, improve their flying skills and socialize. These aviaries will be built according to local weather. In the Loro Parque, given the constant "spring-like" climate, with little variations all year round, outside aviaries can be built, and they are perfect for the health of fledging birds. If this is not possible, some closed, or semi-closed rooms can be used for this purpose.

- Brooders: they are needed to maintain chicks at optimal temperature and humidity level. There are several companies that produce brooders, some very famous and some known only locally, in a very limited area. Before looking into the brand, we believe it is important to select the brooders according to the following:

    1. Building material and strength (they must be long lasting).
    2. Good maintenance of temperature and humidity (once set they should not wave too much, nor be adjusted too frequently.
    3. Inner “real” available space.
    4. Cleaning and disinfecting easiness.
    5. Availability of a local technical assistance service.

- Cages: in the time immediately before the birds are ready to go into the flying cages, chicks can (or must) be hosted in cages. These must be light-weighted, easy to clean and available in number and sizes enough to cover the whole range of the birds that are bred.

- Temperature (T˚): the ideal environmental T˚ changes with the age of the chicks. In this respect, also the workload of the brooders varies depending on that parameter and also on the T˚ of the room where the brooders are kept. The general rule is to keep brooders T˚ around 35-37 ˚C (95 - 98.6 ˚F), during the first 48 hours, and to lower the T˚ to the average environmental T˚ of a given place at weaning. These data are good for most psittacine birds, having a known exception with the Kea (*N. notabilis*), that need a lower T˚. Since the local environmental T˚ changes, with the geographical location, also the brooders management will be adjusted. For example, in Southern and Central Europe the "standard" T˚ in a room is around 20 - 22 ˚C (68-72 ˚F), while the average daily T˚ in Tenerife is around 24-25 ˚C (75- 79 ˚F), this implies that in the Loro Parque, the brooders for older chicks are not warmed. While chicks of the same age in Italy, or Germany, will need some heating.

- Relative Humidity (RH): this environment data is also important. As it is true that chicks do not have a good feather coat to protect them form temperature changes, this is also true for wrong humidity. A good brooder will keep a constant RH, but it is also possible to install a climatizer in the room, in order to maintain constant T˚ and RH. In general parrot chicks will like a RH of 50 - 75 %, but Caiques (*Pionites* spp.) are known to prefer a higher RH (80 - 90 %), for the first three weeks.

LITTER

A right litter is extremely important for young chicks. The "perfect" litter hasn't been invented, to date. This is probably due to the fact that there are not researches into this matter, but many by-products deriving from other fields find a possible market as animal litter. At least is known what

are the ideal requirement for a good litter, so that our choice will fall onto the locally available product that meets the most of these requirements:

1. Hygiene,
2. Absorbing properties,
3. Local availability,
4. "Opinion" of the chicks (do they like it?)
5. Price.

- First period: a very good choice for the first 5 - 10 days is any Scottex-like paper towel. This is soft, absorbing and absolutely non dangerous. The only weak point is the price. This paper must be changed several times per day, and if one multiplies it for hundreds of chicks, it can be a cost.

- Second period: after the first 10 - 12 days the paper doe not work anymore, as the amount of stools increases so much that it would impossible to keep the chicks dry. So towels can be used. Towels are less expensive, as they are not disposable, but they require more working time, as they must be (carefully) washed and dried.

- Third period: when chicks are grown enough, and before they are ready to go into cages and aviaries, a more "natural" litter should be used. Whatever the litter it must be changed very often: a good litter will not improve a bad general management! At the Loro Parque we prefer two materials: wood shavings and crushed corn cob. Wood shavings are inexpensive, but can originate from toxic plants, or wood that has been treated with toxic substances. So that one must make sure of the origin of wood shavings. Further, if they are swallowed, they can be very dangerous. Crushed corn cob is cleaner, but more expensive and must be checked very often for the presence of fungi, or moulds. If it is swallowed in limited amounts by older chicks it is not harmful, but if a very young chick swallows the crushed corn cob, it can be also very dangerous.

A final note: corn cob can be used from day one, and if used properly, chicks are cleaner, but its use must be checked very carefully.

TOOLS

Hand-rearing parrots and other birds is an art, but it can be helped by the use of the right tools.

- Buckets: be ready with cups, buckets, basins and bins of various size and shape. Chicks from different species and of different age need to change their “nest” pretty often. Also, these buckets must be disinfected daily and a replacement is necessary on a daily base.

- Spoons: are the easiest way to feed a chick, but:
  1. must be customized, bending them in the right way;
  2. can only contain a small amount of food, so they are slowing down the job (although this is not important in a small, non-professional breeding centre, it is not good in the case of large number of chicks).

- Syringes: are likely the most frequently used feeding tool for birds. With no doubt they offer some advantages:
  1. are “hygienically correct” (if at the first use are sterile);
  2. are available in several sizes;

3. are available with tips of various size and shape.

Syringes have also some disadvantages, mainly related to their relative high price and short life (in fact after cleaning, disinfecting and rinsing, they become non usable in a few days).

- Feeding tubes: their use is very controversial. Feeding tubes have been extensively used at our institution, but in the last years we converted into the use of simple syringes. The major advantage of feeding tubes is the speed of the job. In fact, a well trained and experienced operator can tube feed many chicks per unit of time. People against tube feeding state that the time difference is not relevant, for well trained personnel. Also they say that tube feeding does not induce a correct swallowing response and chicks will never learn a proper feeding technique for their future offspring. Anyway, if one chooses to tube feed birds, the following points must be considered:
  1. Material of the feeding tube: stainless steel, rubber, silicon, or latex tubes are available. The first ones are long lived, but can be very traumatic in the wrong hands. The soft tubes are better, but (rarely) can be bitten and swallowed. All tubes can be chewed, disconnected from the syringe and swallowed.
  2. Tube diameter: with respect to the size of the chick and its trachea. Ideally you want a tube that is small enough to go smoothly down into the oesophagus, but big enough not to enter the trachea. This means that, per example, an Cockatoo requires a bigger tube, compared to an Amazon of the same size, as Cockatoos have relatively larger tracheas and a small tube can easily enter in the wrong hole.
  3. Tube length, with respect to the length of the neck of the babies and their specific feeding response. Per example macaws have extremely active feeding responses and a short tube can easily enter into the trachea, or traumatize the roof of the mouth, when the chick is "pumping" on it. (*guarda che qui ci sono dei bei filmati sulle diverse tecniche ed anche sui diversi uccelli*)

- Thermometers: the temperature of the food is of primary importance. Formula must be prepared at 40 – 42 ºC (104 – 107.6 ºF) so that it will be fed at 38-40ºC (100.4 – 104 ºF). if food is provided at a lower temperature, chicks will refuse (or not like) it. If formula is fed over 42 ºC (107.6 ºF), it may burn the crop. (*Foto*) It is so important to have good quality thermometers to measure the temperature of the formula. Ideally one should have the formula at 42 ºC (107.6 ºF), and by the time the feeding syringe is full and the chicks are ready, its temperature has dropped down to 41, or 40 ºC (106 – 104 ºF).

- Disinfectants: it is imperative that the nursery and all the tools used there be regularly cleaned and disinfected. Hence, the disinfectants choice is important, too. At our Institution we rotate four different disinfectant on a monthly base. These are: Virkon®, Venno Oxygen® (a oxygen-based German commercial product), a chlorhexidine based and a quaternary ammonium salt based commercial compounds. Requirements for a good disinfectant in a nursery settings are:
  1. effectiveness against the most common avian pathogens, either fungi, bacteria, or viruses;
  2. be strong with pathogens, but mild with living organisms. Anyway tools must be always rinsed before use;
  3. very eclectic use possibilities: ideally the disinfectant should be used for syringes, buckets, cages, brooders and foot-baths;
  4. price;
  5. local availability.

- Heaters: boiling water is a frequent need, in a nursery for birds. There are several way to produce hot water:
  1. Gas burners: to be avoided. Birds are extra-sensitive to volatile toxics.
  2. Electric heaters: they are not as dangerous as the former, but it takes a long time for them to cool down. So they can be dangerous for both the operators and the birds. Especially fledging chicks are at risk, as they may fly on these hot devices.
  3. Microwaves ovens: good choice. Hygienic and effective. The only disadvantage is that a lot pf attention should be out when heating a ready to use formula (i.e. food prepared some minutes before, and still good, but too cold). Microwaves create hot spots within thick fluids, like a formula for chicks, so food warmed this way must be carefully steered.
  4. Electric boilers for neonates: the perfect solution for heating water and other liquids used in the Nursery.

- Scales: to monitor and record the weight of the chicks is a fundamental operation. Chicks should be weighted before the first meal of the day and their regular weight gain is one of the major indicators of their well-being. So that a good scale is an indispensable tool. It is not possible to stat that a mechanical scale is better than an electronic one, but chicks with less than 20 gram BW should be checked for 1/10 gr. increases, and over 20 grams 1 gram division is enough.

FEEDING

Avian nutrition has greatly improved, during the last years, even if it has not reached the same level as in commercial avian species (poultry, turkeys, etc.), or as in mammal nutrition.

- Food Brand: generally speaking we can state that the best avian food brands are producing good to very good formulas for hand-rearing baby psittacines, belonging to the most common and "commercial" species, like African Greys, Blue-fronted and Yellow-fronted Amazons, Blue and gold Macaws, Yellow-crested and Sulphur-crested Cockatoos. On the other hand it is not possible to believe that there is food that works perfectly for all the 350+ parrot species. At the Loro Parque we ran and continuously run trials with different feed for baby birds, that producers are willing to give us on trial. Our "feeling" is that every brand has a "golden food", which works perfectly for a selected group of species, but is not as good for others. Sometimes it is not the same group as indicated by the producer. Also, we have the feeling that several rumours on different feed brands are just avicultural myths and also a good excuse for aviculturists to hide, or ignore their mistakes.

- Water, or other fluids? One of the FAQs is whether water has to be used to reconstitute the dry formula, or other fluids should be used (i.e. Ringer lactate solution). Several papers have been write about this, but if a good water source is available, especially if it is not too hard, it can be safely used. Saline solutions, like the RLS can be used for the very first days of life (mainly because they are guaranteed sterile), or when chicks do have digestive problems, like a slow crop.

- Lactobacillus and other crop flora: the normal bacterial flora from the gut of parrots differs form the one encountered in mammals. Generally speaking it includes *Streptococcus* spp., *Staphylococcus epidermidis*, *Corynebacterium* spp. and *Bacillus* spp. Further, high amounts of a not officially classified *Lactobacillus* will be cultured. The latter seems to be highly important for defending the gut from pathogen invaders, such as most *Enterobacteriaceae*, fungi and yeasts. Parrot parents transfer this "normal" flora by a sort of crop-milk, which cannot be compared to the one produced by columbiformes, but that contains this Lactobacillus

in high concentration. Hence, if chicks are artificially incubated, will not receive this bacterial "starter" and passive immunity with it. Some of the best commercial feeds contain a complete integration, including vitamins, micro-elements and also the "normal" bacterial flora, but is controversial whether this Lactobacilli are present in a concentration that can guarantee they will colonise the gut of the chicks, in an effective and sufficient way. Several commercial "normal" bacterial strains are available for birds, nowadays, but also in this case it is not known whether they are enough specific to live permanently in the GI system of a bird. At the Loro Parque we use a special Lactobacillus strain that has been isolated and cultured at the University of Munich (Germany). This Lactobacillus colonises permanently the avian GI system and is routinely provided to all the chicks that have been artificially incubated, and also to all the chicks that receive an antibiotic treatment. Would such a specific strain not be available, it is advised to use any other product, but for several days (15-20) in order to make sure it will colonise the gut.

- Vitamins: commercial formulas are fully supplemented, so that there is no need for further vitamin additions.

- Other supplements: as we wrote before, formulas proposed by the best avian food producers are generally good for the most common psittacine species, but sometimes a new bird species with different requirements is encountered and these are not fully met by the standard formulas. In these rare cases a special diet needs to be designed. It is important to understand that, by the aviculturist point of view, the easiest way to justify rearing failures is to identify the food as guilty, so that it is not rare to meet breeding facilities rotating three, or four different brands, but having always the same problems. If there is seriously the suspect that a formula is not working in a species, things to be done are:
  1. do not make a diagnosis on a limited number of cases;
  2. check in other facilities with the same species if the formula is working or not;
  3. run a trial with two or three different formulas, when starting with a new “unusual” species;

NURSERY MANAGEMENT PLAN

Here following a simple example of the management plan we use in the Loro Parque.

- **Brooders Temperature and RH**

Check Tº and RH in each brooder every morning. Record Tº and RH on the paper form outside the brooder. RH must be between 50 and 60 %.
Exception: Caiques (*Pionites* spp.) must be kept at 80-90% RH during the first 3 weeks.
Tº inside the brooders must be regulated according to the following table:

Age in days	Tº (˚C)	Tº (Fº)
1	36	100
2	34	94
10	32	90
20	30	96
Feathers start opening	28	82
Feathers are open	Environmental Tº	

- **Food, Weight and Feeding Procedures**

According to different Genus/species birds will receive a different food.
Lories: food A
All the others: food B
(Starting chicks from very small species will receive food anytime the crop empties)

Age in days	**Food dilution (gr. Dry formula/100 ml)**	**Nº of meals per day**	**Time interval between two meals**
1–2	14	8 or more	2,5
3	16	7 or more	3
6	20	7 or more	3
10-20	25	6 or more	3.5
20-29	25	5	4
-/+ 30 feathers start opening	25	4	5
Feathers are opening	25	3	6
Start eating alone	25	2	12
Eat alone actively	25	1	In the evening

(As a rule I would feed a chick less than 10g 10 times a day until it reaches 14-15g)

- **Food amount per meal**

Generally speaking different systematic groups will receive different amount of food, in percent to body weight.

Ara: 12% BW per meal
Cacatua: 9-10% BW per meal
Others: 10% BW per meal

- **Special Species**

Please find here following information about the management of special species.

1. **Hyacinth Macaws**

Age in days	Food
1-7	Macaw formula + 2 ml wheat germ oil every 50 ml of water
8	90% Macaw formula + 10% nut mix 1
9	80% Macaw formula + 20% nut mix 1
14	80% Macaw formula + 20% nut mix 2
30	70% Macaw formula + 30% nut mix 2

The nut-mix has to be prepared fresh daily.

Nut mix 1: 1 part Brazilian nuts + 1 part Macadamia nuts + 4 parts water.

Nut mix 2: 1 part Brazilian nuts + 1 part Macadamia nuts + 1 part crusca + 9 parts water.

2. Poicephalus & Pionus:
Need a high protein and high energy diet: Cockatoo formula + 2 ml wheat germ oil every 50 ml of water.

3. Pionites
2/3 Cockatoo formula + 1/3 baby fruits + 2 ml wheat germ oil every 50 ml of water.