

Macaw Handfeeding and Pediatrics

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Although I believe this guide can be useful for many parrots, the basis of my experience is exclusively large macaws; hyacinths, green wings, blue and golds, Buffon's, scarlets, militaries and red fronts.

There are four components to a successful handfeeding program: a nutritional diet, ample amounts of food consumed, adequate temperature of food and environment, and daily weight records.

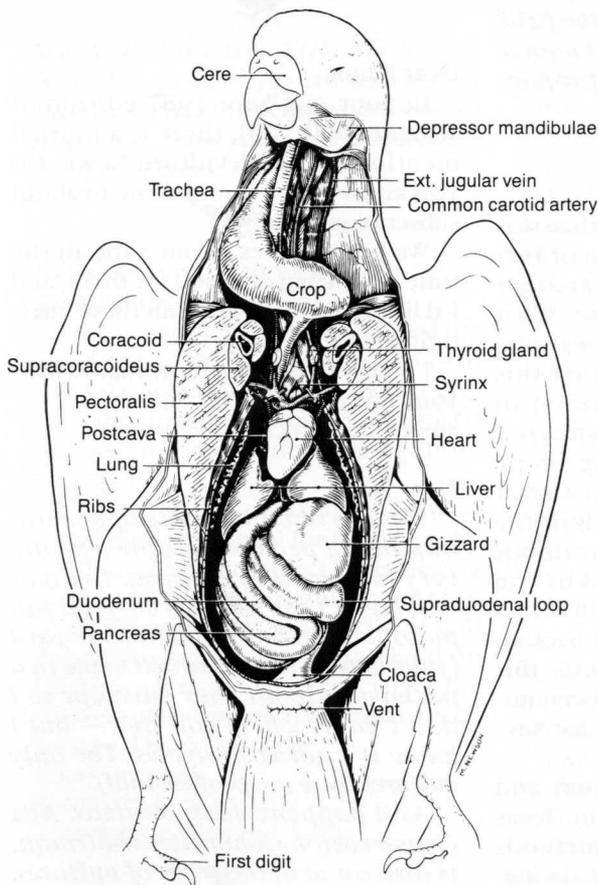
An understanding of the crop is helpful to handfeeding. The crop is an enlarged portion of the esophagus, best thought of as a pouch or holding tank. A full crop does not equal a full stomach. This is why, when you feed your babies late, they will continue to beg for food with bulging crops. Food is trickle-fed to the proventriculus or

true stomach of birds where digestion is started. Next, the food travels to the gizzard or muscular stomach which aids in the breakdown of the harder nuts and seeds. However, the primary organ of digestion is the small intestine.

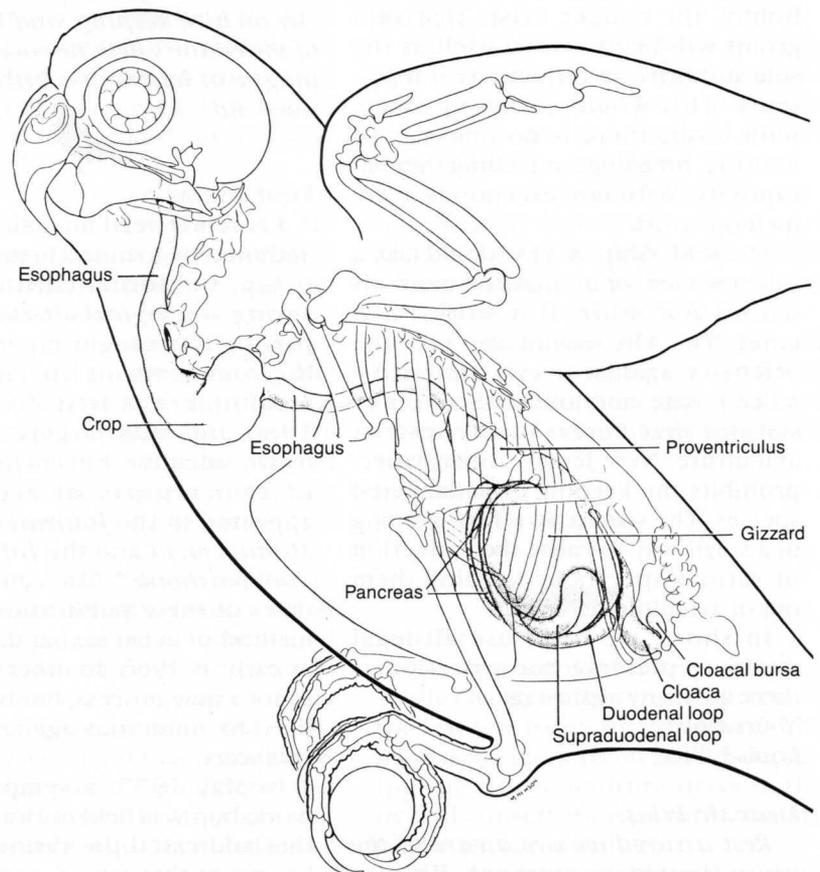
More complications are caused by underfeeding then overfeeding. The parent-raised babies are never allowed to empty their crops. Baby birds under ten days old will start screaming for food with clearly visible food in the crop. I've found that the babies will cry up to 1/2 hour before the crop is empty. Perhaps in the wild this triggers the parents to quickly harvest food before the baby is completely empty. Birds at this stage are fed every two hours around the clock. As their body and crop grow, so does the amount of food increase. Birds fed late will

quickly assimilate the food in order to return their body to normal functions. In my opinion, the lack of a continuous supply of food is the reason some babies ingest substrate material (i.e. shavings, corn cob, etc.). Provided proper hygiene is maintained and the other requirements mentioned in this article are followed, I don't feel there is any need to allow the crop to empty between feedings. I also feel macaws do not require a high protein diet. Studies in the wild show adults don't eat a high protein diet and it is unlikely they feed their young anything different from what they themselves eat.

Presuming your handfeeding formula is nutritionally correct, and you feed the correct amount of food, the last two critical components are the temperature of the food and the babies' environment. Macaws seem to do best



The viscera in situ, sternum and abdominal wall removed.



The digestive tract in relation to the skeleton.

Drawings courtesy of *Diseases of Cage and Aviary Birds* by Margaret L. Petrak.
Second edition 1982. Published by Lea and Febiger, Philadelphia.

with a formula heated to a temperature of 105° to 108°F. This will seem hot to our hands. A thorough stirring is necessary to insure it is well mixed *before* checking with a thermometer. Hyacinths are the most heat sensitive. If the food is too cold they will refuse to eat.

The scale is a valuable tool in handfeeding. Weight loss can be detected as the first symptom up to three days before other symptoms appear. It can be baffling to your veterinarian to be presented with a bird showing no other symptoms. But with cultures and blood work done at this early stage, the chance of successful treatment is high. With these pediatric patients, the earlier the better.

Five reasons for weight loss listed in order from the most common to the least common:

1. Insufficient nutritional value of food. Food may not be an adequate combination of carbohydrates, proteins, fat, vitamins and minerals. Food may be too watered down.

2. Insufficient amount of food. Not feeding enough per feeding, not enough feedings per day, or both.

Either one of the above reasons can cause stunting (see "stunting" below).

3. Bacterial, viral or fungal infections. The usual signs are often non specific and can include loose droppings, weight loss, weakness and poor feeding response. The more common possibilities which can adversely affect weight gain include, but are not limited to:

Yeast: Weight stabilizes then slowly decreases. Macaws are susceptible to yeast infections due to their large lower mandible which collects remnants of food. These remnants can be removed with a clean finger or Q-Tip. Both upper and lower mandible are affected. *Candida* is frequently found contaminating old or spoiled food. Yeasts are opportunistic organisms which commonly reside in the gut. Following antibiotic therapy, stress or being fed food contaminated with yeast can give rise to an infection. In severe cases, white or brown blisters are seen in the mouth.

E. coli: Commonly shed in humans, it can cause many problems for birds.

Pseudomonas: Typical organisms in moist and wet environments where they propagate in water. Regular cleaning of water bowls, humidifiers, incubators and all wet areas exposed to the birds is most effective in controlling the spread of this organism.

Salmonella: Much has been said in the media about the difficulty of killing

the salmonella bacteria found in poultry. Having a separate kitchen for your birds is ideal, but often not possible. Extreme care must, therefore, be taken to insure that sanitary conditions are adhered to, including thorough washing followed by disinfecting in a germicidal solution (we use Nolvasan), of all utensils used for the birds.

Papovavirus: Unfortunately, breeders report no unusual weight loss, only a sudden, rapid death. This virus can spread rapidly through a nursery. Symptoms may include bleeding, bruising and yellow colored urates.

Chlamydiosis (psittacosis): Causes death in babies as well as adults if not treated. Can be transferred to the babies in the egg. It can also reduce productivity of the breeding stock.

Macaw wasting syndrome: Most frequently seen in wild-caught birds, it can be transferred to domestic handfed

babies without proper quarantine practices being followed.

4. Trauma: Burned crop from overheated food. Baby dropped causing injury. Overstretching of the crop. Puncturing the crop while attempting gavage feeding. Food gaviged down the trachea. **Infections or trauma require the consultation of an avian veterinarian!**

5. Genetic problems (least common): If autopsy shows probable genetic abnormalities, a chromosome analysis should be considered to rule out continuing problems with future clutches (see "Sources").

There are three main stages to judge your babies' progress. From best to worst they are:

1. **Thriving:** to grow vigorously or luxuriantly, to improve physically.

Weight: Falls into ranges appropriate for the species and age of the bird.



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Baby nursery — heating pad keeps prewarmed diapers ready for clean-ups and quick changes. Brooder sits in deep, square tub at right.

Skin Tone: Is pink or yellowish-pink, glistening and soft, showing signs of adequate humidity.

General Appearance: Wing tips and toes (extremities) are plump. Eyes are alert and clear when baby is awake. Babies eat with normal head bobbing action. (Note: hyacinths and Buffon's are vigorous feeders). They act contented, making a few soft sounds after eating, then settle down and fall asleep. When the crop is close to empty they usually wake up and look around awaiting food. When babies are under two weeks of age they will cry when they are running low on food, or if they are too cold or too hot. Just like human babies, you need to check all the signs to determine which is the problem. If you just fed, check the other two likely culprits: too hot (baby panting), check if room temperature is too hot or heating pad is on too high. If food is fed too hot (over 108°F)* the baby will sometimes regurgitate it, if you are lucky. Or, if too cold (baby shivering), check substrate to see if it is wet, room temperature is too cold, or may need additional heat from heating pad placed under the cardboard nest box. Food fed too cold will also cause shivering. **An accurate thermometer must always be used to check the temperature of the food!**

2. Surviving: To remain alive or exist.

Weight: The bird maintains body weight or gains or loses small amounts.

Skin Tone: Dry, showing a slightly flaky appearance like chapped skin from lack of humidity.

General Appearance: Baby can exhibit hyperactivity. Minimal signs of dehydration can sometimes be detected. Bobs head strongly up and down during feeding seeming to never get enough food (they aren't). (Hyacinths and Buffon's are normally aggressive feeders.) If these signs are missed and not corrected, the next stage is:

3. Subsistence: The minimal necessary to support life.

Weight: The bird is losing weight. At first 5 to 10 grams, then rapidly (30-plus grams daily).

Skin Tone: Dry, grayish purple skin showing signs of severe dehydration. The skin hangs on the bird in wrinkles.

General Appearance: Activity level — Phase One: hyperactive, very restless,

| BABY BIRD WEIGHT RECORD | | | | | | |
|----------------------------|-----|----------|--------|----------------|-------------|-----------------------------|
| SPECIES: <u>Greenwings</u> | | | | | | |
| BAND NUMBER: <u>013</u> | | | | | | |
| HATCHED: <u>3/23/89</u> | | | | | | |
| DATE | DAY | GRAM WT. | OUNCES | AMOUNT CC FOOD | TIMES A DAY | COMMENTS |
| 4/1/89 | 5 | 60 gm | 2.2 | 4-5cc | 12 | Properly hydrated |
| 4/3/89 | 6 | 55 gm | 2.0 | 6cc | 12 | Staying hydrated |
| 4/4/89 | 7 | 60 | 2.2 | 6-7cc | 2-3 | |
| 4/5 | 8 | 70 | 2.4 | 8-9cc | 3-4 | |
| 4/6 | 9 | 80 | 2.8 | 10cc | 5 | |
| 4/7 | 10 | 95 | 3.2 | 12-15cc | 8 | Eyes are a little more open |
| 4/8 | 11 | 105 | 3.6 | 20cc | 8 | |
| 4/9 | 12 | 120 | 4.2 | 20cc | 7 | |
| 4/10 | 13 | 140 | 5.0 | 35cc | 6 | |
| 4/11 | 14 | 145 | 5.8 | 35cc | 6 | |
| 4/12 | 15 | 180 | 6.4 | 55 | 6 | |
| 4/13 | 16 | 210 | 7.4 | 45 | 4 | |
| 4/14 | 17 | 245 | 8.8 | 50 | 4 | |
| 4/15 | 18 | 285 | 10.0 | 50 | | Banded |
| 4/16 | 19 | 305 | 10.8 | 50 | | |
| 4/17 | 20 | 335 | 12.6 | | | |

Keeping each chick's accurate daily record is very important.

erratic and noisy when awake. Phase Two: sleeps a lot, very lethargic. Toes are very thin, toothpick like, and wing tips are flat and wafer thin. Eyes lack luster. Crop stasis usually occurs. The crop does not move food through normally or at all. Due to dehydration, the water from the formula is digested first, leaving a solid, hard mass of undigested food. This food can't leave the crop without any liquid. The novice breeder might not recognize the problem and might keep waiting for the crop to empty. Without assistance, the crop at this stage is no more likely to empty than a crop full of cement. Heated (105° to 108°F) lactated Ringer's or water should be added and massaged into the dry food to help it pass. In severely dehydrated birds this may take several times.

General Hints

The baby is in an artificial environment. Clearly we should make every attempt to imitate nature. Brooders should be darkened to simulate the nest cavity. Even newly hatched birds are light sensitive. Baby macaws will move to the darkest corner possible to escape light. This occurs *before* their eyes open. Try to be sensitive and read their needs. Careful awareness is required.

Breeders suffer from "brain damage" during the height of the breeding season when we are feeding every few hours around the clock. It is a time when we cut corners and make lack of judgement decisions due to our fatigue. It seems never to be the big mistakes that cause problems, but rather a few little mistakes that together create a disaster.

Selective Complications

Stunting: When a bird is stunted from either the lack of amount of food or the lack of a nutritional food, the head grows disproportionately large for the rest of the body. Feathering may also come in at abnormal angles showing additional signs of a malnourished baby—thin extremities (toes and wings). I have seen a hyacinth adolescent the size of a young scarlet macaw. This bird was at least a pound undersized for a hyacinth. There are variations in size of birds (just like humans) but there should not be a huge difference between the babies and their parents. The prime targets for stunting are hyacinths, green wings and Buffon's, due to their higher weights, especially for novice handfeeders or those used to smaller sized macaw species. But stunt-

* 105° to 108° is appropriate for macaws only. This temperature is too high for other species.



This photo shows the proper way to cradle and support baby macaw's head for handfeeding.

ing can happen in any handfed bird. Macaws should be increasing the amount they are eating every few days or, at maximum, a week while in their growing stage. As they level out and start eating weaning food they will start decreasing the amount of food they eat. But on the large macaws this does not occur until they are in excess of 60 days old and, in the case of a hyacinth, 70 to 80 days old. We do not know whether stunting has any effect on reproduction. Stunting appears to only occur in domestic handfed birds.

Pendulous Crop: Occurs when the handfeeder overfeeds the baby causing the crop to lose its elasticity and hang down. The damage can occur in as little as one feeding. In most cases, if the problem is realized and the cause (overfeeding) corrected, the crop will

eventually regain its muscle tone. It is unlikely that, in the wild, a parent bird would feed 120 cc's three times a day since the adult macaw's crop is estimated to hold about 60 cc's. This is an attempt to simplify an aviculturist's day. At the height of their feeding cycle, it is easier to feed the large macaws 90 cc's four times a day rather than 120 cc's three times a day. The hyacinth is possibly the only exception to this rule. The total amount of both these feedings equals 360 cc's in a 24 hour period. These high amounts of food intake only occur during the approach to their peak weight, before they start weaning. Luckily an over-filled crop usually causes regurgitation, much like overfilling your gas tank.

Bent Beak: The etiology of this is unknown. Again, since this condition



Twenty-day-old scarlet macaw is fed 60 cc four times a day.

does not appear in parent-raised birds, it is thought to be the cause of improper handfeeding techniques. The beak does not need to be handled at all or, at most, very little during handfeeding. The handfeeder's job is to support the head and neck, which is amazingly strong yet wobbly. The beak is very soft and malleable when the chick is young. It does not harden a great deal until the baby is about six months old.

If all of this sounds like the childhood fairy tale, "Goldilocks and the Three Bears," with the too hot, too cold, too much, too little and, finally, just right, you are correct. There is a small margin for error. But the art of handfeeding is definitely self taught through experience. Accurate record keeping helps insure that the same mistakes are not done more than once. And a strong network of friends in the bird world is invaluable. There is a huge quantity of knowledge available from anyone who has bred birds for a number of years.

Weighing the macaw should be an everyday occurrence until the bird is weaned. It is best done first thing in the morning, preferably at the same time every day. The first time through you will have nothing with which to compare your charts, but as you gather more records you will have a good idea of what the weights should be. This chronicle of information will eventually give you the following information:

- a. What a normal, healthy bird of a given species should weight based on the age, and
- b. What amount of food the macaw should be eating.

Try to keep helpful information close at hand. We have had key information laminated (so we can disinfect it) and keep it in our baby nursery.

The following two publications should be in every bird breeder's library:

1. Avian Pediatric Seminar Proceedings, Avian Research Fund, P.O. Box 203, Alamo, CA 94507-0203. \$22 each including postage and handling.
2. Clinical Avian Medicine and Surgery, Harrison and Harrison, W.B. Saunders Co., 1986

Sources

Avian Genetic Sexing Laboratory (chromosome analysis) "Feather Sexing"

Veterinarian consultations for this article were provided by Chuck Galvin, D.V.M. of Novato, California. ●