New Research Highlights Dangers in Handrearing.

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An avian veterinarian who keeps and breeds parrots is a rare and valuable asset to the avicultural world. Nigel Harcourt-Brown, who practices in Harrogate, Yorkshire in the UK, has carried out more groundbreaking research, this time using his own chicks. As one of only four veterinarians in the UK with a diploma in avian medicine and surgery (there are only 23 diploma holders in Europe), he is one of the most authoritative sources available.

Mr Harcourt-Brown specializes in breeding *Pionus* parrots, the group of small to medium-sized neotropical parrots (including the Maximilian’s Parrot) distinguished by their red undertail coverts. He has reared more than 100, some species to the third generation. For this study he used chicks of the Dusky Pionus Parrot *Pionus fuscus*, a beautiful bird variably arrayed in unusual hues of pink, brown, buff and violet.

He used a nest of five Dusky Pionus Parrot chicks and observed them from hatching until they were fully grown. He x-rayed them from the ages of 16-45 days before bone growth was completed and also noted their behaviour and the development of their feathers. This study was carried out after he reached the conclusion that juvenile osteodystrophy, which results in the bones bending and twisting as the bird grows heavier, was not only influenced by diet. An imbalance of calcium and phosphorus and/or a lack of vitamin D are recognized as contributing to abnormal bone development in chicks. A lack of minerals and vitamin D (or inadequate ultraviolet light) are recognized causes of bone disease in poultry.

An artificial effect of handrearing parrots is that they are active from an early age. If they were in a nestbox or, in the wild, in a natural nest cavity, the interior would be dark. Chicks huddle together and do not move around much until they are well developed. On the other hand, parrot chicks being handreared are often kept in glass-fronted brooders or other locations where there is a high level of light. When removed to be fed they are usually taken out of the container and allowed to run around on the surface on which they are being fed. Both these factors mean that they are active and using their legs before the bones are fully developed. The growing bones are not designed to bear the weight of a parrot chick that is very active.

There have been few studies of bone growth in parrots, except on the embryos of Budgerigars. Nigel Harcourt-Brown therefore used his Dusky Pionus chicks to obtain information of vital importance to all parrot breeders. The aim of his study was to evaluate the growth of the skeleton and relate it to their behaviour while they were growing in the relatively natural conditions of parent rearing. The food offered to the parents consisted mainly of soaked mixed peas and beans,
chopped apple and carrot and a vitamin and mineral supplement (Professional Breeder Supplement made by Pet Chef) containing 80 000 iu/kg vitamin D3, 4.5% calcium and 3.6% phosphorus).

At the end of the study the x-rays were examined to determine the rate of bone growth and when each bone ceased to grow. Detailed measurements were made of the ulna and the tibiotarsus. In birds this bone is the equivalent of our tibia (the inner bone of the lower leg).

His x-rays showed that very little skeletal development was visible on a one-day-old chick (it had died the previous year and had been preserved). By day 16 most of the bones were visible, except the tarsal and carpal bones. By day 39 the tibiotarsus and femur (the top leg bone) were fully developed; by day 43 the radius and by day 45 the ulnar carpal bone, humerus and pectoral girdle were fully formed.

The drawings of the legs of the chicks, aged 16-45 days, should be carefully examined by all parrot breeders, bearing in mind that they are looking at a species that leaves the nest aged eight weeks. They can adjust the growth rate for other species depending on how long they stay in the nest. It will help them to understand why chicks that are being handreared should be permitted to move around as little as possible until shortly before they would leave the nest. Their bones are not capable of bearing the weight before this age. Coupled with the fact that the diet of many chicks is deficient in calcium or that there is an imbalance in the calcium-phosphorus ratio, or a deficiency of vitamin A and/or the parents have no access to sunlight or ultraviolet light, it is not surprising that so many young parrots have signs of juvenile osteodystrophy.

Mr Harcourt-Brown’s findings, published in The Veterinary Record of 10 January 2004 were that the five naturally reared Dusky Pionus Parrots ‘were prevented by their behaviour from becoming ambulant [active] until their skeletons had matured and until most of their feathers had stopped growing and become pneumatised…. In some birds with mild signs of juvenile osteodystrophy it is possible that over exercise is a major factor in the development of their bone deformity.’

These results, together with those of his earlier paper on the incidence of juvenile osteodystrophy in handreared African Grey Parrots, in which 44% had skeletal deformities, suggest that in addition to a dietary deficiency, handrearing could predispose parrots to skeletal malformations through the encouragement of abnormal physical activity and premature weight bearing on growing bones. Affected African Grey Parrots had a deformed tibiotarsus but none of them had a deformed furcula (the ‘wishbone’). The furcula has the role of conserving energy during flight by acting as an elastic, compressible spacer. It also affects the circulation of air between the air sacs and the lungs during flight. In contrast, the tibiotarsus bears the weight of the chick as soon as it can stand.
Note that in the nest small parrot chicks beg for food only by raising their heads; they huddle together providing much mutual physical support. As they grow they stand upright but do not move around much due to the small size of the nest chamber. Natural parrot nest cavities tend to be much smaller than those provided by breeders so that by the time the young are fully grown the parents might only feed the young at the nest entrance because their offspring are filling the interior!

In contrast handreared parrots have frequent opportunities to walk about and some breeders even encourage this. I have also seen a tendency for inexperienced breeders to place newly hatched or small chicks in quite large containers that permit too much movement. (They must also be quite uncomfortable.) The chicks should have tissue or towel packed around them to prevent much movement. In the light of Mr Harcourt-Brown’s findings, it would be wise to keep chicks in a darkened or reduced-light environment (once they are feathered this could even be a bucket with a towel over the top) to prevent excessive movement or attempts to climb to the top of the container. They should be removed one by one, not moved together and allowed to run about while another sibling is being fed. While actually being fed they should stand on a surface that they can grip strongly, such as welded mesh. Again I have often seen chicks being fed on a slippery surface that forces their legs apart when they move vigorously in response to the spoon or syringe.

Mr Harcourt-Brown concluded his paper by stating that ‘limiting the movement of chicks until after the bones have stopped growing should help decrease the risk of tibiotarsal deformity. Ideally, full movement should be prevented until the wing feathers are completely grown, and some of the young birds should be examined radiographically at the end of growth.’

When I spoke to him recently he emphasized the fact that all responsible breeders should have one or two young parrots x-rayed as soon as they are weaned and ready to go to a new home. When I asked him how much this would cost he said: ‘In the region of £60 per bird—but that would be a lot cheaper than being sued for producing deformed birds’.

Concur with this. Breeders must take responsibility for the birds they rear. By failing to do so they could be producing birds that will be permanently crippled. Not only are they deceiving the public but they are condemning many parrots to a life of pain or disablement.

To briefly recap his earlier paper published in April 2003 in The Veterinary Record, African Grey Parrots are often affected by clinical signs that can be attributed to a lack of calcium and vitamin D in their diets. Adult pet birds can suffer from hypocalcaemia, resulting in convulsions, adult breeding birds can be affected by egg binding and osteoporosis, and growing birds can suffer deformities of the bones.
During his study of pet parrots that were plucking their feathers, each bird was anaesthetized and examined. The examination included the bones and joints to assess any abnormalities. Each bird was then x-rayed using the same film, screens and processing, as well as using the same views and positions. The radiographs were carefully examined for signs of skeletal diseases and, if necessary, were compared with x-rays and skeletons of wild-caught African Grey Parrots.

Thirty-four hand-reared African Grey Parrots, ranging in age from 16 weeks to 13 years, were x-rayed. The breeders and their diets were unknown. The results were highly disturbing. Fifteen of these birds (44%) had signs of osteodystrophy, although none of the owners had realized that the parrot had a bone or a limb problem.

Some were severe cases. Twelve of the birds could not fly; in 10 cases this was due to wing clipping, feather plucking or because the bird was not allowed out of its cage. The other two parrots were flightless due to wing deformities. Some of these birds appeared to adopt a wide-based stance when perched normally. Five birds had apparent leg problems, such as a deformed foot, a lame leg or flat feet. The tibiotarsus was affected in every case of osteodystrophy. In 25% the pelvis was also deformed. Limb deformity causes abnormal weight distribution and this leads to pressure sores on the feet.

Mr Harcourt-Brown told me that all these African Grey Parrots had been sold as ‘normal’ for high prices. In another case, in which the parrot was brought for treatment due to the fracture it had suffered, x-rays revealed that the number of fractures was 29.

The study showed the importance of a diet that contains adequate calcium and vitamin D, especially for the laying hen from about six weeks before egg laying commences. Mr Harcourt-Brown pointed out that using a calcium supplement in the drinking water is not as effective as using a powdered supplement on the food. To use sufficient calcium in the water makes it so unpalatable that the birds will not drink the solution. If the solution is weak enough for them to drink, it does not provide sufficient calcium or vitamin D to fulfill the nutritional requirements. This does not happen if the powder is sprinkled on the food. Powdered supplements are absorbed well, in spite of some claims to the contrary. I would suggest that the calcium for a pet bird be placed inside a favoured item of food, such as a grape. For breeding birds it can be added to the softfood or rearing food and they will not even be aware that it is there.

Mr Harcourt-Brown mentioned another significant factor. It seems likely that breeding African Grey Parrots have a greater requirement for ultraviolet light (or sunlight) than some other species. Breeders would therefore be wise to make use of UV lights.