The Mouse Went Down The Hole- Revisited
Let Nature Be Your Guide

Cassie Malina
Director of Staff Development
Natural Encounters, Inc.

At the 2003 IAATE Conference I presented a paper called "The Mouse Went Down The Hole, Psychological Appetite: Natures Training Tool". That paper was developed because I saw some troubling information being presented on weight management, which led me to believe that birds were being managed at dangerously low weights. My paper was well received and I am happy that it is still referred to by many respected professionals in our industry.

I was inspired to develop this current presentation because there has been renewed discussion on the topic of food and weight management and my current thoughts, perspectives and ideas may help trainers successfully forge through this complex topic. My main goal has not changed and I believe it is one we all share. That is, to keep the health and welfare of our birds our top priority.

In order to facilitate this goal I recommend we do some self-evaluation. We should look at our current programs and program goals, and find a way to manage our birds that meets our program goals while keeping the bird's health and welfare a top priority. Each of us is in a unique position with the programs we present, the environments we work in, the animals and staff we work with, as well as the audiences we inspire, so we should evaluate our situations individually. We should also remember that it is our role as ethical stewards of our program birds to work within the realms of the species and individuals' natural behaviors. Some mantras I like to practice are "We are responsible for our bird's behavior", "It's a study of one", "Performance, feedback, revision", and "Let nature be your guide". In regard to "It's a study of one", I believe it is a study of one in regard to the animal and the situation. In regard to the animal, it is a study of that one individual's behavior (bird/trainer) and in regard to the situation each circumstance that we are in as professional bird trainers is unique.

The IAATE Food Management and Weight Management Position Statement defines food management and weight management in the following way:

Food Management
Food reinforcers are often used to increase motivation to present a desired behavior when training birds. Managing when and how food is delivered, what food items are offered, and the ratio of food items offered can create desire to present behaviors for food reinforcers. This practice is referred to as "food management."

Weight Management
Because the weight and appetite of an animal are valuable indicators of its general health, monitoring a bird's weight can be a valuable tool in understanding its motivation to

present a desired behavior as it relates to various weight ranges. Once a weight range that corresponds to acceptable behavioral responses to food is established, a diet is prepared to maintain the bird in that weight range. The weight range may be adjusted depending on response during training sessions. Various conditions may influence behavior, such as weather, age, food items, etc., and should be taken into consideration when evaluating weights and diets. These weight ranges may also vary between individuals of the same species. The goal is to maintain the highest weight possible and provide the greatest amount of food while maintaining the desired behavioral response. This practice is referred to as "weight management."

Food and Weight Management

In this paper I will combine these strategies and speak about food and weight management because both procedures are related. The way in which one presents food can effect the animal's motivation to acquire that food and how much of that food may be consumed and an animal's weight is related to how much food it consumes.

Food management is a primary tool used to train most animals. Whether trainers weigh their animals daily or not, those animals' weights are varying over time and conditions. And with all animals, the amount of energy they expend in a day will affect their required diet and healthy weight. The smaller the animal, the more careful any trainer must be when they manipulate that animal's diet. Our birds are weighed in grams. There are 454 grams in one pound. While the variation of a few grams here or there is not a need for concern, the variation of 5 - 10% of the body weight in a bird may be significant in regard to the bird's health when that bird weighs an average of 4-6 pounds. It is also significant in a mammal that weighs an average 4-6 pounds. In an animal that weighs an average of 500 pounds a change in weight of 5 - 10% may also be significant. Without regular weight records on our animals we could unintentionally be doing them a disservice.

As the title suggests, the weight of a bird is at the core of "weight management". Therefore, scale training your bird is integral to using weight management. Scale training can be achieved using food management and is a great way to begin to develop a relationship with your bird based on positive reinforcement. If you are creative, you can set up your environment to scale train your bird in protected contact. For example, if the bird is not comfortable with you in its personal space, you can put the scale in the enclosure and train the bird to come over and get on the scale using preferred food items or portions of its diet while you are outside the cage. This gives the bird the power to choose to participate in the training session at a pace the bird is comfortable with while at the same time associating the trainer with positive experiences, food and treats, thus building positive trusting relationships between bird and trainer.

One aspect of both food and weight management is withholding some form of food from the animal in some way in an effort to give that food more value. With food management, one may withhold the entire diet and deliver it in a predetermined way throughout the day or one may leave the bird with a full bowl of non-preferred food items and use preferred

food items for training. If one chooses to use preferred food items, weight training is also beneficial as preferred food items are often those that are most fattening, which may cause unhealthy fat deposits if given in excess. A bird that fills up on preferred food items may choose not to eat other diet items and thus may get a less nutritionally balanced diet. When one chooses to deliver the entire diet sufficient to maintain the bird's current weight range to the bird in portions throughout the day, then the value of the food items for the bird increases. This can allow you to ensure your bird consumes a healthy balanced diet. The procedure of delivering a healthful diet in several small portions throughout the day often causes the bird to eat more food than it would when an abundant diet is provided one time per day.

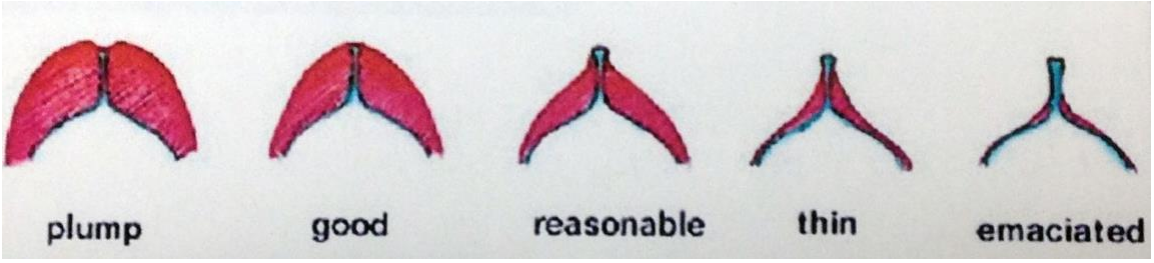
Steve Martin first referred to this as "psychological appetite", meaning the small quantities of food may have in some way allowed the animal to perceive a food shortage which led to it eating more food to store up in the lean food environment. Dr. Susan Friedman later described this phenomenon as "the food paradox". It is important to note that psychological appetite or the food paradox is not something we do to birds. These labels simply attempt to describe the behavior observed as the result of feeding an abundant healthful diet in several small quantities as opposed to the same amount of food being fed all at one time. Birds tend to eat more food and have higher motivation to perform behavior at higher weights when food is fed in smaller portions. This food acquisition strategy in many ways is similar to the food acquisition strategy of many, or most, birds in the wild.

Regardless of the term you choose to use, the important point is that with food and weight management you are creating value in the food. When birds value the food we provide them, we can use food to train a variety of behaviors. They are motivated to problem solve and offer a variety of creative behaviors to earn the food rewards. Animals under our care can be trained to showcase those species typical and individual behaviors associated with food acquisition along with other natural and inspiring behaviors by using what nature has provided all of us, the instinctual desire to eat. They can learn medical behaviors, behaviors to reduce stress and enrichment behaviors. They can be trained to accept a variety of environmental distractions and changes including accepting cues from a variety of trainers. The more they learn the more they can generalize their experiences to multiple situations and the more resilient they become. The more resilient they are, the less likely they will have fly-offs.

It is important to reiterate that if food has more value then birds may eat more of it. Following that, there is the possibility of weight gain. If a bird is not flying regularly, burning fat and developing muscle, then the bird is at risk of becoming overweight. There are several resources available to rate the body condition of your birds. The rating is based on the amount of fat or muscle surrounding a bird's keel bone. (Figure 1) Recently at an IAATE conference I heard a veterinarian speak about birds storing fat around the legs and wing pits in addition to around the keel bone. Knowing the physical condition of your bird is incredibly important and training your birds to allow you to feel their body condition is highly recommended when you enter a food and weight management

program. If you ever find yourself in the position where you have to restrain your bird for any reason that is also a good opportunity to check their body condition.

Figure 1. Looking for Starvation: Evaluating the Pectoral Muscles. (Chubb)



At Natural Encounters, Inc., if we decide that a bird's entire diet will be delivered by the trainers in portions throughout the day then we scale train that bird so we can monitor its weight daily to ensure the weight remains within a healthy range. A bird's healthy weight range will naturally fluctuate based on many factors including season, temperature and age so one should expect the healthy weight range of their birds to vary throughout the year and lifetime of the bird, (Malina, 2003; Scott, 2014). The only birds in our food and weight management programs we do not individually weigh daily are our flocks of pigeons. Due to the social and competitive behavior of pigeons in regard to acquiring food, we can train flocks and gage their healthy weights without the need to scale train 14 pigeons in a group setting. We look at how many pigeons of the group choose to voluntarily load for a show and we evaluate their feather condition and other physical and behavioral conditions. If 1-3 pigeons in a group of 14 do not load for show then we know, paired with looking at their physical and behavioral condition, the group is at a healthy weight. We also feel their keels regularly to give us further assurance. When we check their keels we consistently find that 98% of the flock rate a "good" on the above body condition scale, which is appropriate for a flighted pigeon flying multiple times a day in our outdoor free flight shows.

When the choice is made to manipulate a bird's diet and weight to increase motivation it is important that one has a deep understanding of proper food and weight management. As stated in many published discussions on this topic, proper use of food and weight management can have numerous benefits to the birds and the inspiring programs we produce, and improper use of food and weight management can cause many detrimental side effects including death.

If one chooses to manipulate a bird's weight and lower it to increase motivation to perform a behavior, it can be helpful to lower the weight quickly so the motivation can be increased without the bird's weight falling below 10% of its healthy ad-lib weight. Healthy animals should be able to have a 10% weight loss. However, when choosing to lower a bird's weight to increase motivation to perform a behavior, one should never choose to lower it 10% automatically or as a first step in a training plan. If we choose to lower the bird's weight to create motivation we do it with great caution and let the behavior of the bird be our guide. We cut back a portion of food and lower the weight

approximately 2% of the individual bird's healthy ad-lib weight. At this point we often see a change in behavior. If we find through weight adjustments that we have lowered the bird to 10% of its healthy ad-lib weight, we seriously re-evaluate if that bird is the best candidate for the program and training plan. Most often, we will alter the plan so the bird can perform an alternative desired behavior reliably and consistently at or around their healthy ad-lib weight. Also, we focus on distant and immediate antecedent and consequent behavior change strategies as well as application of scientific principles such as differential reinforcement and the Matching Law in an operant conditioning program focusing on positive reinforcement to modify behavior before we ever decide to lower a bird's weight.

When our birds are consistently performing well in shows, we continue to slowly increase their weights. As a bird's weight increases beyond its healthy ad-lib weight, you may see behavior changes and once reliable behaviors may begin to breakdown. Referring to weight and diet records may reveal seasonal trends. It is important to be aware of these signs so that fly-offs can be avoided. If you are not flying your birds, it is very important to evaluate their physical condition so that illness due to obesity can be avoided. If you are flying your birds you should also regularly evaluate their physical condition to ensure they are at healthy weights and their keel conditions are within the healthy range.

When behavior breaks down, we evaluate all factors as stated above. When we evaluate weight, we look to weight and behavior records for the bird's entire life along side records of individuals from the same species. Having daily weights on our birds for many years helps us understand healthful weights that keep the birds from dangerous health issues including illness due to obesity or fly-offs.

As stated above, a 10% weight gain in a bird is also significant. It may be an indication of a bird that may be gaining an unhealthy amount of weight, which could cause medical issues including bumblefoot or fat related illnesses. Alongside evaluating the bird's weight history and current physical condition we consider the season. Is it a seasonal fluctuation as happens with cooler weather? Or, it may be an indication, as we've seen, that the bird may be about to lay an egg. When our birds begin regularly laying eggs, we see their weight increase as the egg goes through the final stages of development. When we see their weight rise we do not decrease their food. Instead, we make sure they have a slightly increased healthful diet including any added nutritional supplements that may help with healthy egg laying. Some of our birds may begin to leave food over just before they lay the egg. We record the leftovers and continue to give the same diet so we ensure they have the nutritionally required intake of food to healthfully support their body going through the natural process of egg production and laying. Having daily weight records for our birds over many years has helped us understand these trends and respond appropriately.

If you are starting a food and weight management program, as you work to gain a deep understanding of the procedures through experience, please reach out to your colleagues

and allow them to share their experience and knowledge and help you do your best for your birds and your programs.

Ethical Considerations

At the 2014 IAATE Conference in Dallas, Texas Barbara Heidenreich presented a paper entitled "Weight Management in Animal Training: Pitfalls, Ethical Considerations and Alternative Options" in which she introduced several possible detrimental side effects that may be associated with improper use of weight management that I found worthy of further discussion. It is important to explore concepts linking food and weight management programs with animal welfare in an effort to share information and tools that may ensure we maximize the health and welfare of our collections and avoid finding ourselves in detrimental and unethical situations.

IAATE Position Statement on Food Management and Weight Management

The IAATE Position Statement on Food Management and Weight Management clearly outlines best practices when it comes to food and weight management. It explains all the things that should be taken into consideration and practiced when implementing a food and weight management program. Some stated benefits to properly using a food and weight management program to train your birds are the following:

- Primary reinforcers can give trainers a starting point for training
- The use of coercive training strategies can be minimized
- Birds potentially eat a more balanced diet

When trainers use primary reinforcers such as preferred or other food items, they begin to develop positive, trusting, long lasting relationships with their birds. They are also able to monitor the intake of their birds to ensure a healthy and balanced diet. Additionally, it has often been shown that animals will perform more varied and complex desirable behaviors when trained with positive reinforcement than when trained with negative reinforcement or punishment strategies, which do not involve food as a reinforcer or punisher. And, coercive and aversive training strategies can have scientifically proven detrimental side effects for your animal, (Sidman, 1989). Those detrimental side effects include escape/avoidance behaviors, increased aggression, apathy, and over generalized fear of the environment.

The IAATE Position Statement also clearly states some detrimental side effects associated with misusing food and weight management. Those include:

- The health of the bird is compromised
- There is a breakdown of behavior
- Poor feather condition and an unnatural molt cycle
- Presentation of aggressive and/or other undesirable behaviors

These points are clearly explained in the Position Statement and are summarized here. *"When using food management, excessive use of preferred food reinforcers may reduce consumption of a balanced diet, which may lead to compromised health. The combination*

of food reinforcers should satisfy the nutritional needs of the bird. Food management strategies that do not take into consideration the physiological needs of the bird can lead to health issues. When using weight management, excessive reduction in weight may lead to illness, and/or death. For example, anemia may be brought about by imposing a fixed body weight, which does not compensate for the body's demand for increased food while training high-energy behaviors, such as physically demanding flights. Without sufficient nutrition to allow for the muscle-building process, a bird's metabolism will draw upon muscle and blood protein from the body to get energy. In addition, if its weight is too high a bird can be susceptible to obesity- related health issues."

"When using food management, failure to consider the relationship between feeding schedule and training sessions may result in a breakdown of behavior due to a lack of motivation for food. For example, feeding too much of a bird's diet before a training session may decrease its motivation. When using weight management, excessive reduction in weight may cause the bird to become too anxious and focus only on the food instead of the training process, resulting in diminished learning or increased latency. Additionally, reducing the weight too low can cause a loss of appetite, health issues, and reduction of motivation to perform behaviors. Similarly, if a bird's weight is too high it may lose motivation for food, possibly resulting in increased latency, inattentiveness, or loss of a bird due to a fly-off."

"When using food management, failure to implement a feeding schedule that is in accordance with the physiological needs of a bird may result in a bird exhibiting anxious behaviors in the presence of trainers and/or food. This may result in feather damage. For example, anxiety or excessive motivation for food may result in a bird flapping or jumping towards the trainer and hanging on enclosure bars. When using weight management, prolonged excessive reduction in weight can interrupt or prevent the natural molt pattern or increase the likelihood of improper feather growth. Birds that work at or near their ad lib weights will usually have molt patterns and cycles that are similar to their wild counterparts. Misuse of weight management can also cause feather damage due to excessive motivation for food that may result in a bird flapping or jumping towards the trainer and hanging on enclosure bars."

"When using food management, failure to consider the relationship between feeding schedule and training sessions may result in undesirable behavior. For example, withholding food for an extended period of time may result in anxiety and/or excessive motivation for food. Similarly, when using weight management, a weight that is either too high or too low may cause a bird to present undesirable and/or aggressive behaviors towards a trainer, other people, or other birds. If a bird's weight is too low it may exhibit undesirable behaviors related to anxiety and/or excessive motivation for food. Alternatively, if a bird's weight is too high, it may present undesirable behaviors, like fear responses to routine environmental stimuli, increased latency, or aggressive behavior such as territorial defense. "

We can all agree that improper food and weight management programs can have detrimental and possibly fatal side effects. It is important that we fully explore these

detrimental side effects in detail so we can further educate ourselves as we continue to evaluate and improve our programs.

Behaviors observed in the presence of food reinforcers

There is a continuum of behaviors that may indicate different levels of hunger. The table below provides a valuable example to reference as it speaks to observable behavior, which should always be our focus.

Table 1. Assessing interest in reinforcers. Example: Macaw is offered a pine nut, (Heidenreich, 2014).

Observed behaviors	**Levels of motivation**
Holds pine nut in foot	Low
Bites tiny pieces off of pine nut slowly	Low
Drops half of the nut	Low
Wipes beak on perch (feaking observed)	Low
Proceeds to preen after drops nut	Low
Holds pine nut in foot and brings to mouth quickly	Medium
Quickly breaks nut into 2-3 pieces and swallow pieces	Medium
Directs attention back to trainer once nut is consumed	Medium
Swallows nut immediately without breaking into pieces	High
Quickly directs attention to trainer once nut is consumed	High
Offers trained behaviors in rapid succession	High
Presents behaviors equated with frustration or anxiety about food: may redirect aggressive behavior on nearby objects, birds, or people, stereotypic pacing, etc.	Excessive
Aggressive behavior presented towards other birds if competing for the same food resource	Excessive

It is important if we observe behaviors associated with a low interest in the food reinforcer that we note them in the bird's behavior records. A bird with a low interest in food could potentially fly off or, if not actively flying, could potentially be over weight or sick. With detailed weight, training and behavior records you may find seasonal trends with these behaviors. As long as their performance is consistent and their body condition is healthy there is no need to adjust their weights.

If we observe behaviors associated with a medium interest in the food reinforcer the bird is most likely at a healthy weight and is engaged and enriched in the training program. Detailed weight records combined with regular physical examination of body condition will most often support this. There are cases in which a bird's behavior may appear within this medium interest range, but there is a decrease in weight. In many instances this may be due to seasonal changes, as weight records over many years will support. Regardless of a bird's weight history, any time we see a decrease in weight it is important that we evaluate if the bird might be ill and in need of veterinary attention. Birds often mask behavioral signs of illness and by the time they are showing behaviors indicative of illness they may be very ill. Often, weight loss is a first sign of illness. Daily weight records showing a continuously decreasing weight can alert trainers to possible illness, which can allow prompt diagnosis and treatment.

It is crucial if you observe behaviors associated with a high or an excessive interest in the food reinforcer that you consult your weight records and consider if the bird's weight might be too low. If you are seeing behaviors associated with a high interest in the food reinforcer, consider slowly increase the bird's weight until you see behaviors associated with a medium interest. If you see signs associated with an excessive interest in the food reinforcer often, quickly increasing their weights by giving them significantly more food daily may alleviate these behaviors.

When I find myself in situations where the data suggests the bird is at a healthy weight but its behavior tells me different, I look to myself and other trainers and I evaluate our responsibility for their behavior as well as their reinforcement history. Is it possible that we have trained these behaviors that topographically look like those associated with a bird that may be labeled "too hungry"? We can operationalize "too hungry" as demonstrating behaviors associated with a high or an excessive interest in the food reinforcer. Are the chickens rushing at the door at us anxiously partly because we reinforce that behavior with the opportunity to enter the crate and have access to a variety of food reinforcers presented in varying proportions? Could we train them to wait patiently with two feet on the ground rather than rush or jump for reinforcers?

I can't stress enough the importance of constantly observing the behavior of your birds. At our show facility we have several different runs or rows of bird enclosures. Every time I walk down any run I evaluate the behavior of each bird and especially as I come down the row loading birds for the show. What I see often, which gives me confidence that our birds are food and weight managed properly, are relaxed species typical behaviors. These may include an ibis in its bathpan taking a bath, a Seriema laying on its back sunning, an owl dozing, a vulture resting squatted low on its perch or standing upright with its wings fully extended sunning, a parrot chewing its toys, a raven exploring its environment or a hawk sitting on its perch watching me walk by. If I see birds charging the side or front of the cage before I approach their specific door, then that is an indication to me that their weights may be too low. I then look at their weight, diet and behavior records for their entire history over years, maturation and seasons, I evaluate their physical condition and I decide if it would be healthy and safe to raise their weights. If I decide they are at healthy

weights, then I alter their feeding schedule and I train them with differential reinforcement to wait patiently until the door opens or until the trainer presents their hand or glove.

We should be thoughtful when we make assumptions about observable behaviors. A trainer may see a flock of 15 macaws jumping from perch to perch quickly as one or two trainers deliver food reinforcers to each of the 15 birds and say those birds are "too hungry". If they question what they see, they may learn that those young and adolescent birds are free fed pellet, and they are simply eager to compete for limited peanut resources as they would for Brazil nuts or other resources as a flock of 15 in the wild. Having daily weight records for the birds and an understanding of natural macaw development and behavior provides valuable information in this assessment.

I have found in my 17 years of experience that social species such as parrots, corvids, and chickens and other fowl will perform reliably in shows even if they have left over food in their bowls. This behavior may be attributed to their social nature and hand rearing. It is possible they continue to quickly approach the door in anticipation of an opportunity to interact with those that raised them and are a part of their social structure. Where I live we have a totally free-range hand raised chicken named 'Piggy' that chooses to hang out with those that raised her in the area she was raised. When we gather socially, she appears and scratches in the dirt among our social circle. I have also found through my professional experience that increasing chicken diets and weights to the point that this behavior subsides has had undesired side effects. The show behavior often breaks down and upon evaluation of their entire weight history and present physical condition we find the bird is overweight. This may be further attributed in part to their limited flight and, therefore, limited high energy, fat-burning behaviors. The fact remains that if the above situation is not remedied with a proper weight management plan, we have seen illnesses arise. An understanding of the natural behavior of the species and the individuals' behavior patterns is an integral factor in properly caring for them.

With sound training plans focused on understanding and applying positive and differential reinforcement and the Matching Law we can train behaviors alternate to or incompatible with those that appear to demonstrate an over eager desire to obtain food reinforcers when the bird is at a healthy weight. While we don't know what an animal is thinking or feeling, knowing through proper food and weight management that our birds are at healthy weights should inspire us to think of alternative reasons why they may seem over excited to acquire food and/or participate in training and presentations. We may wonder if part of their desire comes from immediate reinforcers like how we deliver the food or distant reinforcers like the opportunity to fly and perform in our programs, or a combination of the two.

I have experimented with this theory many times with many different species and generalized it to multiple trainers in multiple scenarios. With a variety of species that demonstrate the behavior of rushing the door we use their diet to train them to station on a perch before exiting the enclosure. With raptors that lean towards the glove or food hand, we reinforce sitting upright, quietly looking away from the food source with

relaxed body language and feather positioning. We train parrots to sit upright and offer a plethora of different subtle behaviors ranging from eye and head movements to foot movements, which are incompatible or alternative to displaying juvenile behaviors like wing pumping. With pairs of macaws that aggressed on each other in competition for our attention and other reinforcers, we trained them to station at opposite ends of a perch and target with their beaks a hanging target object in their enclosures while one or the other is selected. In a show situation similar macaw behaviors have been replaced with sitting facing the audience at different points on the perch. With vultures we replace wing pumping with sitting still with wings in and heads up. With cranes that walk with us crowding us with beaks focused intently on our food hands we train walking along side and just behind us with heads up and beaks pointed forward. With toucans we train looking away from us rather than having their long beaks inches from our noses as we walk them on the hand. With birds that dig or aggressively try to snatch or pull food from our hands or gloves we alter our presentation of the food so that food is easily accessed.

Raptors tend to respond to movement more so then what reinforcer may await them when they fly to that station where the fingers were waving as a cue, which consistently predicts a food reinforcer will follow. Fading out a baiting strategy and replacing bating with cues that predict varied positive reinforcers will consistently follow performance of the desired behavior can decrease latency when training all birds. For example, when we call birds to our hand, glove, or station we have the food reinforcer hidden in the hand delivering the finger-waving cue. As soon as the bird lands on the station, the food reinforcer is immediately delivered and discovered. The reinforcer may vary with the level of performance to further help decrease latency. Focusing on the behaviors and working to modify them through training with positive and differential reinforcement and the Matching Law is a wonderfully enriching way for both the trainer and bird to build on their repertoire of behaviors and experiences.

Examples of specific behaviors observed

Frantic or Anxious Behavior

“Animals may show frantic or anxious behavior demonstrated in the presence of food, when eating or when a stimulus is presented that is a potential indicator of food”. (Heidenreich, 2014). Mark Habben states, “It is frequently associated with a mal nourished bird, a juvenile bird, birds which share an enclosure with aggressive con-specifics, poorly imprinted birds, birds which have frequently had food removed from them by a trainer, birds which have been “tricked” into flying to a specific piece of food which has then been swapped for a smaller piece.”

This behavior can be witnessed in birds where food and weight management is misused as well as in birds demonstrating natural behaviors or as a result of poor training strategies. Gulls naturally often compete for and steal food. Corvids naturally cache or store their food for later. Often, a corvid will anxiously grab at any and all food items presented. It may gather them and then cache them somewhere in the enclosure.

It is crucial to consider your full responsibility for behaviors you observe. If we often use food to positively reinforce birds for a variety of behaviors ranging from subtle to complex those birds will be enriched by the opportunity to experiment with which behaviors may gain reinforcement. They are most likely partly motivated by the food reward and partly motivated by the enrichment and secondarily reinforcing value of the interaction with the trainer. They are also often times motivated by the way in which the food is delivered and the timing of the presentation of the food.

In regard to food delivery, some birds may quickly scoop food from your hand, aggressively peck for pellets held in your hands in the shape of a tight bowl, or pull at your glove as they eat meat from it. With the first example I notice this is more likely to happen when the trainer withdraws the hand as the bird is eating rather than withdrawing the hand after all the food is eaten and the bird's body language indicates they understand there is no more food (they lift their head up and look away). With the second, opening up that bowl a bit so birds can easily eat the pellets quickly alleviated this behavior. In the third example, allowing the bird to easily take food from the glove without the need to pull and quickly opening the glove when the main meal is done, leaving it open for the bird to pick bits and then withdraw their head indicating they have decided the meal is done before the trainer removes the glove from the bird will quickly alleviate this behavior.

Often we unintentionally reinforce behaviors associated with a high or excessive interest in food reinforcers due to the timing of the delivery of our food or secondary reinforcer. A parrot lunges at its cage mate just before we request it to step up onto our hand for a food reward and a ride to an enriching destination or a young vulture is reinforced while wing pumping as he stations on a scale. A chicken pecks its cage mate just before we provide the group's diet. A hand raised parrot looks up into our eyes and pumps its wings just before we deliver a food reward and a smile (a possible secondary reinforcer) for sitting on the hand as we walk from point a to point b.

In some situations these behaviors may have initially been an indication of a weight lower than the healthy range but through repeated paring with positive reinforcers, including enriching opportunities, the behavior is maintained. In many situations these behaviors may be naturally species and/or age typical and have been inadvertently repeatedly paired with positive reinforcers.

Trainers should remain keenly vigilant to behaviors interpreted as frustration. Any behaviors associated with frustration not quickly alleviated by the trainer by providing more information to alleviate our part in the cause of the frustration are in danger of escalating to aggressive behaviors. Any behavior, desirable, undesirable or aggressive that is repeated is being reinforced. Aggressive behaviors are a danger to our birds, our staff and our guests.

Water gorging/Food related stereotypies

“Water gorging should be considered an indicator that the feeding strategies are either inadequate in quantity and/or frequency. This can also result from long term chronic quantitative restricted feeding.” (Heidenreich, 2014) If one observes water gorging in their birds it is imperative that they evaluate possible causes and implement a plan to reduce this behavior. Behaviors that have a long and varied reinforcement history may require a plan which includes allowing the bird free access to a complete diet of all chosen foods for several months and then restarting a food or weight management program which includes giving birds large amounts of healthy filling foods and/or giving them more meals in a day. With any bird, giving it a portion of its diet in the morning as its breakfast and a portion in the evening close to sunset will often alleviate this behavior. The breakfast and/or evening portion may include a large amount of healthy fruits and vegetables for a parrot. For a bird of prey, the evening portion may include casting material such as rabbit fur. If you are giving fresh fruits and vegetables, any uneaten portion should be removed at most an hour after delivered to prevent E.coli issues.

Stunted Growth

“Unfortunately stunted growth has also been observed in birds in bird shows, especially those that have been placed on quantitative restrictive diets during their first year.” (Heidenreich, 2014) Mark Habben states, “It should not be considered acceptable to manage the “weight” or food intake of a bird during its developmental or growing period. The only time this should be considered is if the bird is over feeding to a point at which its health is compromised. There is a variety of conditioning that can be worked as a pre-requisite to any dietary programs before a bird reaches its full growth potential. For the majority of Falconiformes and owls, growth and development is very fast but regardless of this, any animal should be afforded the opportunity to reach its natural (comparative captive) size before any dietary restrictions are implemented. Full development is usually significantly faster than 12 months in many raptor species, many reaching fledging point within a four month period. Any dietary restrictions prior to this point are not acceptable and impede growth and development. A full and varied diet should be provided.”

Training young birds can easily happen without the need to restrict their diets. Weights should be managed to increase at healthy percentages as dictated by the natural development of the species and individual. Young parrots can be trained to come to you, move perch to perch, step on/off your hand, and go into a crate/carrier with their formula at frequent feedings and the formula should be given to them until their crop is full and they choose to stop eating at each feeding. As they mature to pellets, they can be trained for formula and other treats while they have full access to an excess of free pellets and the appropriate amount of fresh fruits and vegetables. When they are of fledgling age, they can have their free pellet removed at the end of the day (which aids in pest control) and they can be trained throughout the day for treats, fresh fruits and vegetables and pellet and given access to some additional pellet and fruits and vegetables after each session and free access to pellet after the end of the final training session. Young birds of any species can be trained similarly.

Persistent juvenile behaviors

"A phenomenon that has been observed in some species of birds that are entered into a quantitative restricted diet during development is the persistence of juvenile behaviors into adulthood." (Heidenreich, 2014) Mark Habben states, "Persistent juvenile behavior is complex and can be associated to a number of factors. Supplementary feeding in "parent raised" birds, heavily restricted diets, a training program instigated utilizing food management too early on in a birds development (Particularly prevalent in *Buteo, Parabuteo*, *Aquila* and *Haliaeetus sp*). Behaviors can range from continual "screaming", juvenile feeding behaviors such as heavy mantling on a glove or station and can also lead to aggression in older birds. As well as this, some behaviors can evolve through prolonged association to a person with food over a number of years. In many hawk species utilized in falconry *Buteo jamaiciensis* for example, behaviors can manifest themselves if the bird consistently fails to successfully hunt (or the falconer persistently fails to provide opportunities for quarry). This may happen if the bird only ever receives food from the same source (a Human). The condition is rarely reverted even if consistent, successful hunting is achieved or regular lure or station work is practiced to disassociate the trainer from food."

The persistence of juvenile behaviors into adulthood may be associated with birds that are food and weight managed during development. This may occur with proper or improper food or weight management. It often occurs when those juvenile behaviors that are displayed during development are positively reinforced either with food or secondary reinforcers or both. Secondary reinforcers gain their reinforcing value by being paired with primary reinforcers. The trainers then continuously or intermittently reinforce those behaviors into adulthood. A training program using positive and differential reinforcement can replace those behaviors with alternate more desirable behaviors if the trainer finds those behaviors undesirable. In my experience, an adult condor that pumps its wings in the presence of people is significantly less likely to demonstrate aggressive behaviors.

Overeating until sick when put on feed up or free feed

"Some parallels we observe is that even birds working above ad libitum weight and perceived to be responding due to psychological hunger are often obsessed with food acquisition, anxiety before feeding times, gorging when food is available, and overeating until sick when put on feed up or free feed." (Heidenreich, 2014)

In my experience I have never heard of a bird working above ad-lib weight overeating until sick when put on feed up or free feed. If your bird overeats to the point of becoming sick when put on feed up or free feed it may be a clear indication that you are managing your bird at unethically and fatally low weights. Overeating until sick has been observed in the rehabilitation setting with injured raptors that are emaciated when found. If you experience this, I recommend you offer the bird a crop size portion of food multiple times a day once the crop has emptied. The overall amount you offer should be a large but healthy amount of food as dictated by the species in the wild and the size and physical condition of the individual. As the bird stabilizes and behavior indicates the bird is eating

comfortably rather than lunging frantically for the food you should do an exam of the bird's physical condition to see if the bird has enough fat and muscle around its keel bone to burn a free feed or feed up diet and still have fat and muscle for daily species typical activities. An examination of that bird's physical condition at the time the bird became sick from overeating would most likely have revealed an emaciated or thin keel. I have heard birds in rehabilitation situations may exhibit this behavior as they are often found thin or emaciated. I recommend you slowly increase the bird's weight to its highest healthy ad-lib weight and then put the bird on feed up or free feed for several months before entering into a proper and ethical food and weight management program. I also recommend that during this recovery program you simultaneously train the bird to display calm upright body language as food is delivered. Regular exams of physical condition along with daily weight records will help you know when your bird is at a healthy weight.

Trainers should not become complacent or desensitized to observing and evaluating all of the behaviors exemplified above and they should develop and execute a plan to modify those behaviors. By remaining observant to all behaviors, subtle and obvious, trainers can keep their birds most healthy and enriched. And, they can adapt species or individually typical behaviors into inspiring educational opportunities for our guests.

Food seeking opportunities

"While a perceived food shortage may allow a bird to have motivation at a higher weight, it raises the question is this an acceptable psychological state for birds in an animal training program? A frequently presented argument is that psychological appetite replicates a natural occurrence in the wild. Animals don't always have food available and must seize opportunities when they arise. The crucial difference is that animals in the wild have the opportunity to seek food. Animals that do not have food seeking opportunities and are on restricted diets have been shown to have an increase in presentation of food/oral related behaviors such as repeated pecking at water in chickens that can develop into stereotypies." (Heidenreich, 2014)

It is true that wild animals have the opportunity, and necessity, to seek food. In our programs we provide that same opportunity through interacting with the trainers, audiences and their captive environments. It is a fact that in all captive animal situations food is delivered by us rather than by nature. We can deliver the food in excess all at once every day or we can manage how we present the food to increase an animal's natural behavioral repetoire and showcase those behaviors to the next generation of conservationists.

Additionally, when food and weight management are used appropriately, alongside a positive and differential reinforcement training program, animals are given the choice of what level to participate in our programs. Behavior Science findings state that choice is a primary reinforcer. While our birds most often choose to participate, there are times when they choose not to. And we should equally respect their choice not to participate. After exploring all possible health, body condition, immediate and distant antecedent and

consequent factors that may contribute to their repeated choice not to participate, if the conclusion is that the bird is simply not motivated for offered food including its personal favorites it is recommended one consult the bird's weight history. A free flying bird that is working above its ad-lib weight and is not motivated by food may have a fatal fly off if the trainer ignores precursor behaviors.

Animal welfare

The Farm Animal Welfare Council believes that an animal's welfare should be considered in terms of Five Freedoms, which define ideal states for acceptable welfare. While animals in our settings are not specifically referred to in their list of situations where the Five Freedoms should apply, some have referenced these freedoms in relation to our profession and our use of food and weight management and they have relevance. In regard to the Five Freedoms, while some farm animal facilities may achieve some or all of the Freedoms, it is integral that we achieve all of them when we care for our birds. Proper food and weight management can play a significant part in achieving these Freedoms.

The Five Freedoms are:

1. **Freedom from hunger or thirst** by ready access to fresh water and a diet to maintain full health and vigor

We absolutely should always allow our birds regular access to food, letting nature be our guide. Wild parrots, corvids, cranes, ibis and many other species generally eat multiple times a day therefore our captive counterparts should be provided with meals multiple times a day. Raptors that eat once daily naturally should also be provided at least that opportunity. Our raptors are provided food throughout the day for performing desired behaviors. Some birds such as vultures do not eat every day in the wild and some trainers will give their captive counterparts a fast day. Regarding ready access to fresh water, I cannot think of a scenario in our programs and industry where we would find any reason to deny our birds this freedom. With proper food and weight management used to train birds a variety of behaviors, birds can consume a healthful diet and maintain full health and vigor.

2. **Freedom from discomfort** by providing an appropriate environment including shelter and a comfortable resting area

This freedom does not speak to food and weight management directly however training with proper food and weight management can teach birds to utilize a variety of shelter and resting areas within their environments.

3. **Freedom from pain, injury or disease** by prevention or rapid diagnosis and treatment

A proper food and weight management program provides birds with healthful diets, which aid in the prevention of disease. Weighing our birds daily achieves this freedom in

regard to rapid diagnosis and treatment because weight loss is often one of the first signs of illness or disease in a bird. An excess of weight can also cause disease. Post mortem reports of free fed aviary birds will frequently demonstrate lack of condition and excessive fat, (Habben, 2014). Regular training and interaction and a keen eye will also alert you to signs like droopy eyes or wings or not putting full pressure on one foot, which could be an early sign of disease or injury. Additionally, in our free flight programs, birds motivated to return to their trainers are less likely to end up in dangerous or fly-off situations, which may cause pain or injury.

4. **Freedom to express (most) normal behavior** by providing sufficient space, proper facilities and company of the animal's own kind

This freedom does not speak to food and weight management directly however training with proper food and weight management can teach birds to demonstrate a wide variety of normal behaviors in a wide variety of environments, possibly more so then if they were free fed in an aviary situation. A proper food and weight management program can also allow you to train birds in group situations.

5. **Freedom from fear and distress** by ensuring conditions and treatment which avoid mental suffering

Using a proper food and weight management program speaks significantly to this Freedom. Training using positive and differential reinforcement strategies can be incredibly enriching for birds and it can be used to train a plethora of natural, medical and enrichment behaviors that build a bird's mental health. In our programs, proper food and weight management is one valuable tool in achieving this goal. Additionally, when our birds in our free flight programs are motivated to return to us, we avoid the mental suffering that may accompany a fly-off.

Food and weight management in companion parrots

"An unfortunate observation is that weight management has been presented to the companion parrot community several times as a solution to creating motivation in pet parrots." (Heidenreich, 2014) All experts in the industry agree that weight management programs that include a reduction in weight to motivate a bird to perform desired behaviors are not necessary for companion parrots. Parrots are social species that are most often seen in small family groups. If the home environment provides companion parrots with varied positive mental and physical stimulation and positive and differential reinforcement training techniques using positive reinforcers such as fattening treats that remain about 5% of their overall diet, toys, attention, opportunities to socialize and opportunities to learn and practice new skills as well as species typical and enriching behaviors on a regular basis, as they would in the wild, then there is no need to reduce a pet bird's weight. Just as we do not reduce the weight of our pet dogs, cats, amphibians or rabbits unless it is because they are unhealthily overweight, we should not reduce the weight of our pet parrots. If a companion parrot owner chooses to take their bird outdoors

to fly free, it is highly recommended they develop a food management plan that will help ensure their bird's safety. Additionally, consulting with reputable experts with a deep understanding of applied behavior analysis is highly recommended when executing a free flight training plan with companion parrots.

Conclusion

In nature animals must take advantage of the limited opportunities to obtain reinforcers and a primary reinforcer is nourishment. When used correctly food and weight management can aid us in caring for our birds at the highest level and simultaneously achieving our goal of inspiring the next generation of our earth's stewards. It is integral that we educate ourselves on the proper and ethical use of food and weight management as well as the natural history and behavior of the birds, the individual history and behavior of our birds, the proper and ethical use of operant conditioning and our part in and responsibility for our birds' livelihood. Our overall training goals would benefit if they included plans for scale training, training to accept physical exams, and training comfortable body language. When you consider what strategy to use, whether you choose food or weight management or training with secondary reinforcers or some combination, evaluate your birds and programs and choose what works best for your overall goals, with the health and welfare of your birds first and foremost.

All programs can also greatly benefit from using a variety of secondary positive reinforcers to train behaviors. We should always look to the behavior of our animals and use what they like to reinforce desirable behavior; whether it is a treat, toy, attention, a scratch on the head or time in the sun. As with food reinforcers, secondary reinforcers are reinforcers because the animal's behavior will either increase or maintain for the consequence of gaining or avoiding them, which means those items have value. When we train, value is often created through managing access to the valued item and presenting it in association with the desired behavior. When food and weight management are used correctly, secondary reinforcers can also strengthen behavior. For example, a bird that is at a comfortable healthy weight range will play with toys and those toys can be used to reinforce behaviors such as entering an enclosure or crate.

In regard to weight ranges, indoor programs, programs with non-flighted birds, or programs where there are just a few consistent trainers with a small group of birds bonded to them due to adolescence or years of positive experience and history may have birds with higher target weight ranges than some outdoor programs that free fly birds in multiple and varied environments to multiple trainers multiple times a day. With many outdoor programs, as birds age and continue to gain new and varied positive experiences with new and varied trainers, building resilience, those target weight ranges may be equally high in select birds. It is something trainers free flying birds in outdoor programs should strive for.

I encourage you to reach out to your colleagues to share, gain and grow knowledge and I encourage you to consider practicing these mantras:

We are responsible for our bird's behavior

As you observe behavior, remember to take responsibility for those behaviors that are desirable and undesirable. Is the bird displaying undesirable behaviors, such as mantling, screaming or other aggressive behaviors, because its weight is too low or because you have inadvertently reinforced those behaviors? The best gift you can give another is the gift of honest and open two-way communication. If you respect your birds then you'll listen to them and that means learning to watch and correctly interpret and respond to their behavior.

It's a study of one

We are each individuals with our own level of training skill and experience. Each of our birds is an individual with its own natural, personal and learning history. Each of our programs is different with regard to staff, environment and audience.

Performance, feedback, revision

Continue to revisit and revise your training and management practices for the benefit of your birds and your motivation to inspire caring action towards conservation of our earth's resources. Through clear and honest two-way communication the behavior of the trainer and the bird can be modified as needed to support your goal to work your birds at the highest healthy weights possible.

Let nature be your guide

We should not be afraid to use food and weight management, we should be sure to use it properly and ethically and we should always let nature be our guide when we develop and distribute the birds' diets. Knowing the natural history of the birds we interact with is integral to providing them the highest level of health and welfare.

Mark Habben said, "Weight management is a balance between achieving the movement required from the bird and optimizing its health and condition, it should not be practiced by novices, it should not go un-challenged it should be frequently reviewed. If a bird's behavior is contrary to requirements or expectation, the first thought should be to increase its food, not take it away."

"I totally agree that there is a lot more to free flight and training than micro-managing weight. However, weight, diet, behavior, observation, experience, instinct, knowledge and knowing the individual bird should all come together to work an ethical and responsible training program that allows a bird to fly free. Questioning and challenging practices such as weight management and tethering is the right thing to do. Practices fixed with tradition are infrequently challenged and a lot of work needs to be implemented to ensure that best practices and bird welfare are the highest priority. I have to question, what is more beneficial to a bird. To not manage its weight at all and maintain it within an aviary? To manage its weight and fly it free and provide it with

greater choice and enrichment. To do neither or both depending on the species or the bird." (Habben, 2014)

The more we discuss these important topics and share experiences and perspectives the more likely we are to continue to strive for and achieve best practices in our industry. We should continue to explore, test, report on and practice the most ethical, most positive, least intrusive practices that support the five (or more) freedoms every animal is entitled to.

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