# Using a Fusion of Operant Conditioning and TTEAM to Train Giraffe Calves

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## Abstract

All the giraffe calves at The Oakland Zoo undergo an extensive conditioning program to prepare them for a successful life in a captive husbandry situation. Beginning when the calf is between five and fourteen days old, keepers initiate basic desensitization and simple operant conditioning behaviors. Keepers use a combination of traditional operant conditioning techniques and the Tellington Touch Equine Awareness Method (a training system for horses) to achieve sophisticated behavioral goals. Under this comprehensive system, calves are trained to participate in halter and leading exercises, trailer loading, target training, radiograph training, recall and name recognition. They learn to tolerate voluntary blood draws, farrier work, full physical examinations, and grooming.

## Introduction

Working with giraffes brings many challenges due to their natural history and physiology. A giraffe calf outweighs most of its human trainers at the moment of parturition and by the time it reaches adulthood can grow to be 19 feet tall and weigh upward of 4,000 pounds. Despite their massive size and status as the tallest land mammal, they are still a prey species. In the captive situation giraffes retain their prey instincts to kick or bolt from any perceived threat. Therefore, maintaining animal and trainer safety in the captive environment is of the utmost importance. The giraffe keepers at The Oakland Zoo employ a fusion training method, using operant conditioning in partnership with the Tellington Touch Equine Awareness Method (TTEAM), to safely achieve a multitude of behaviors necessary for appropriate medical husbandry programs.

The Oakland Zoo has a thriving and prolific giraffe breeding program. The first nine months of a giraffe's life is the only period when they are small enough to safely be trained in a free contact situation (without a barrier separating trainer and animal); a window of time that affords an opportunity to influence the animal's behavior by involving them in a modified version of the TTEAM training program. TTEAM is a method of animal training consisting of three parts: the TTouches (bodywork), the Confidence Course, and groundwork exercises. Giraffe calves who complete the giraffe version of the TTEAM program grow to become adult animals with a less sensitive startle reflex, reduced fear of unknown people and unfamiliar objects, increased body awareness, and tend to be more interested in and responsive to people. The fusion method used at The Oakland Zoo produces giraffes that can be trained and handled more easily, and most importantly, more safely. It is important to note that since giraffes are not domesticated, and it is not necessary to ride them, portions of the TTEAM methods are either completely omitted or adapted to comply with established safety protocols. When developing their program, keepers at The Oakland Zoo eliminated the portions of the TTEAM system related to physically riding an animal and altered the leading exercises and ground work to allow for greater distance between the trainer and giraffe. As originally defined by creator Linda Tellington-Jones, TTEAM is free of any negative reinforcement and punishment but does not incorporate traditional operant conditioning. The program designed and employed by Oakland Zoo keepers Amy Phelps and Melissa McCartney is a fusion of these two training methods.

## Introducing TTEAM

Immediately following birth it is crucial that dam and calf are allowed sufficient time to bond prior to any human interference. This helps to ensure that the calf will nurse reliably and consistently. Keepers have found that dam reared calves can successfully grow into highly tractable and easily trainable animals with nursing serving as a natural reinforcer. Depending on the individual animals, keepers begin interacting with the calf between 3 and 10 days of age, and take full advantage of the times when the calf is nursing. The initial interactions consist of stroking the calf with a dressage whip (known in TTEAM parlance as a wand) serving as an extension of the keeper's arm and allowing for physical contact with the calf while ensuring keeper safety. This beginning wand work is kept brief, no more than 30 seconds per nursing session, so as not to interrupt feeding. Giraffe calves do not readily eat solid food until they are between 14 and 21 days of age, so the dam's milk is used as a physical reinforcer for the calf tolerating the wand. Keepers also take advantage of moments when the calf is resting, habituating him to tactile stimulation by stroking him with the wand while he is lying down. Calves often protest the wand strokes by biting at the wand, twitching their skin, stamping their feet, and occasionally kicking. Keepers continue stroking the calf, despite minor protestation, until the animal stands calmly at which point the wand is removed. This teaches the calf that protesting does not make the wand work end and, within just a few minutes, the animal usually stops fighting and realizes that being touched is not a threat to his life. When the calf calmly accepts the strokes, keepers move on to TTouching the animal using the wand to perform circular TTouches.

## Why Incorporate TTouch?

When introducing training and activities as potentially stressful as taking an ultrasound image, obtaining a radiograph, drawing blood, etc., keepers were looking for a way to reduce the giraffe's discomfort and anxiety when faced with new equipment, unfamiliar people, and possibly unpleasant pressure on/manipulation of the animal's body. To this end, the benefits

of working outside of the Oakland Zoo restraint chute became readily apparent; tension levels are lowered as the giraffe is not confined and allowed the freedom to walk away whenever the situation becomes overwhelming (see *The Giraffe Husbandry Manual* for photos of the restraint chute). When calves reach a size that makes free-contact training too dangerous, work moves to an off-exhibit holding yard instead. Working through hatches cut in a chain-link fence allows the animals to observe all the action around them and thoroughly investigate all new equipment and people without being hindered by the solid walls of the chute. Thus the giraffes are voluntarily participating in all training and their discomfort can be gauged by their reactions; a tail swish might indicate mild annoyance while leg lifting or walking away indicates extreme agitation. Since the giraffes have the freedom to leave at any time, the potential for training to become a drawn-out process is greatly increased as calves have the option of leaving frequently or not returning at all if uncomfortable or unwilling. Training therefore has to be as calm as possible and a decidedly enjoyable experience in order to work for long periods and attain a reasonable rate of success and forward momentum.

One of the main tenants of the TTouch method is the release of fear and the fostering of a more affirmative relationship between animals and trainers. Rather than randomly touching the giraffe, keepers determined TTouch would achieve the same end goals of traditional operant conditioning alone while making the desensitization process a reward in and of itself with TTouch acting as a secondary reinforcer. Training calves to submit to touch becomes an enriching experience wherein the touch itself serves a purpose (release of tension, etc,) as well as a means to an end. As the calves become comfortable with the touch, their posture relaxes and the training process seems to become a positive experience. With a better awareness of their own bodies, developed through the use of TTouch all over the body, they begin to comfortably stand still without fidgeting, shifting weight, or tail swishing for longer periods of time. Often the animals lean into the touch and adopt a relaxed posture. The amount of time it takes to introduce novel items or new stimulations is reduced and the negative reactions to these changes are less pronounced.

Keepers are likewise able to cut down on the amount of food rewards needed during training as oftentimes animals will accept TTouch as a reward and do not reach for the food items being offered, instead standing in a relaxed posture and ruminating while being TTouched. This allows training sessions to go on longer as animals do not fill up on food and choose to walk away; keepers have found a second means of reinforcing behaviors.

## What is TTouch?

Much of the training discussed in this text revolves around the use of Linda Tellington-Jones' "TTouch Method". In many instances it was deemed unnecessary for the purposes of this text to describe in any great detail the exact technique involved in each touch. TTouches are named after the individual animal that inspired the TTouch. The precise names of the various TTouches are listed along with a general description of their intended purpose, except where finer detail was appropriate for clarification. In order to successfully utilize the following methods, one need not be intimately familiar with Tellington-Jones' teachings or the philosophy behind the Tellington TTouch. Instead it may be considered a framework for discussing the extent of tactile manipulation an animal will allow and serve as a shorthand language when discussing pressure, amount and type of contact, and areas of the animal being worked on. For more information on TTouch, including visual guides and comprehensive instructions regarding each type of touch, please visit www.tellingtontouch.com.

TTouch was developed by Linda Tellington-Jones as a method originally designed for work with horses. The Tellington Touch (TTouch; pronounced Tee-Touch) is a form of bodywork made-up of an assortment of circles, slides, and lifts performed with the hands. The basis of TTouch is the circular touch wherein the skin is moved over the muscle in a one-and-a-quarter circle and the incorporation of this non-habitual movement in daily care is found to foster a more positive relationship between animal and trainer. Combining assorted hand positions and movements with varied finger pressure (rated on a scale from one to nine), the technique has been adapted to domestic animals and pets along with exotic species and even humans. There are a wide range of uses for TTouch including behavioral modification, a decrease in healing time from wounds or injury, an increase in the animal's body-awareness, as well as strengthening the bond between caretaker and animal.

## Tactile Stimulation

While calves are introduced to being handled through the use of the wand, hands-on manipulation is essential to training. As the animal becomes calmer when being worked with, eventually the wand is shortened by the trainer sliding a hand up the shaft until, ultimately, the wand becomes superfluous and hands-on contact is safely possible. At approximately 14 days of age the calf is offered tiny pieces of soft foods such as bananas or bread while keepers use TTouch to extend the tactile stimulation. For example, a TTouch known as Lick of the Cow's Tongue, an open-handed stroking movement, is used along the spine to reduce the instinctive fear of things coming from behind or is used around the groin region to alleviate the discomfort that comes with palpation of this area. Before keepers can attempt in-depth bodywork, shifting cues are taught to help safely position and move the giraffe during training.

## Training Movement Behaviors

At approximately 21 days of age the calf will eagerly consume solid foods and is introduced to the operant conditioning program utilized for the adults so as to form an association between a behavior and a consequence. Keepers begin by conditioning the bridge; the calf is given a small piece of food immediately following each of the keeper's whistles (the bridge). This action is repeated numerous times until the calf

learns to equate the whistle with food. Once the bridge is established, target training is the first behavior introduced in order to help the animal understand that they now have to perform a task to receive a reward. The verbal cue "target" is given and the calf must touch his nose to the target (a pool buoy on a stick) to be bridged and reinforced.

As soon as the calf reliably "targets," the shift commands "move up" and "back up" can now be introduced, as can "steady." Being able to safely control the calf's position and trust it to hold still dependably is vital to working with calves in a free-contact situation safely and makes later leading exercises and ground work possible. Although they are not as large as the adults, these calves are between 122 and 200 pounds and their behavior is relatively unpredictable. Humans could easily be injured by a running, leaping, flailing giraffe calf.

"Move up" is defined as the animal taking one step forward while "back up" involves one step backwards. Keepers are able to teach these shifting behaviors using a baiting system by positioning themselves and presenting the food reward and then repositioning themselves and the food forcing the animal to shift in order to obtain the reward. Standing just out of reach in front of the animal, the keeper presents the treat and gives the verbal cue "move up." Once the calf steps forward he is bridged and receives his primary reinforcer. To train "back up," the keeper pushes the food toward the neck, directly below the jaw, while giving the verbal cue. In order to obtain the food, the calf is forced to step back. As soon as he backs up he is bridged and rewarded.

In order to be able to safely touch the calf's body, keepers need to be assured the animal will remain still and need to be confident the giraffe will not kick, bolt, or otherwise injure any humans or themselves. Initially the verbal cue "steady" is offered to the giraffe for standing without fidgeting. As long as the animal stands without shifting weight, lifting the feet, or shying away from the keeper, they are bridged and rewarded every three to five seconds after the verbal cue is given. Over time they are asked to stand for longer and longer periods while holding the "steady." Once they reliably stand holding still for one minute, keepers progress to asking the giraffe to hold a "steady" while being touched.

### Advanced Body Work

Now that the calves can be positioned safely and are certain to hold still, keepers resume more intense bodywork. The process of desensitizing the giraffe to being touched begins at the head and neck and moves down the body to the legs and feet. This system works from top to bottom because as a prey animal, giraffes are generally more comfortable being touched on the head than they are on the legs. Manipulating the legs often stimulates a preditorial defensive reaction to kick. While it may seem beneficial to start with a lighter touch until the animal is at ease, keepers found that firmer pressure works better as it is less likely to stimulate the fly twitch response from the giraffe. With such thick skin, a strong and purposeful touch functions better than a gentle one. Since each training session is no longer than 10 to 15 minutes in duration, keepers ask the calf to hold "steady" and choose particular TTouches based on the behavioral goals of each individual giraffe and the training session. It has been found that certain TTouches enable them to train particular behaviors in a less stressful and more efficient manner, and teach the animal that being handled by humans or with medical equipment is not a threat to their life and safety. Once this has been accomplished, advanced training goals are quickly realized.

### Reducing the Startle Reflex

Much like other prey species, giraffes have an instinctive fear of things that are above them and behind them. This nervousness is often the cause of kicking, jumping, or bolting episodes; keepers utilize tail work and a saddle pad to help calves minimize this fear response. Tail work begins at the dock of the tail with small Raccoon TTouches along all of the vertebrae. Tail circles are gently completed, culminating in tail pulls. The giraffes appear to particularly enjoy the tail pulls and readily lean onto their forefeet, stretching and elongating their back. Tail work reduces the risk of a keeper startling a calf when moving around the animal's hind-quarters, and makes the free contact situation less dangerous.

A saddle pad is used as a tool to teach the giraffe not to panic when an item is above or placed over their body. In the captive situation many animals incur serious injuries due to overreaction when they perceive that their life is in danger from an object as harmless as a plastic bag, towel, or baseball cap; saddle pad work is completed in an attempt to reduce the risk of such unnecessary accidents. This begins with a keeper holding the pad while simultaneously feeding the calf, and the pad is gradually moved closer to the animal until it is lightly pressed against their neck or shoulder. The pad is then placed against their abdomen and eventually over the back. The calf is asked to hold a "steady" throughout this progression and is rewarded on a fixed ratio of every 3 to 5 seconds for doing so. Once the calf is comfortable with the saddle pad lying over their back, keepers simulate possibly frightening situations while continu-

ing to ask for a "steady." For example, the saddle pad is abruptly pulled off the calf's back and dropped onto the ground, or it is pushed so that it slides over the croup and down the buttocks. As long as the giraffe holds "steady" during these situations they are reinforced on a fixed schedule. Keepers have found that these exercises reduce the calves' flightiness and make them much safer to work around as they grow. Reduced sensitivity to objects covering the body allows keepers the option of using blankets and fly sheets when necessary as well.

The TTEAM body wrap is a useful tool that helps giraffe calves through instances where their behavior indicates that they are nervous or insecure. It appears to assist the calves in remaining calm in new situations and has proven to reduce their fear of things behind them. The body wrap is often used as part of halter training and the Confidence Course to ease the animal's apprehension in novel or challenging training sessions. Elastic bandages are tied together to make one solid piece and this elongated bandage is then wrapped around the giraffe's body in various configurations, the most common of which is around the hind-quarters and over the withers. The TTEAM body wraps do not restrict the calf's movement, but instead make the calf simultaneously aware of it's entire body rather than focusing on pressure or stimulation in any one particular area.

A wide variety of TTouch bodywork is used to facilitate calves in remaining calm and relaxed as novel items are presented to them. Keepers introduce unfamiliar items that may trigger a flight response (including those used later in the TTEAM Confidence Course) such as foam pool noodles, plastic sheeting, towels, blankets, hats, logs, and straw bales. These items are slowly moved closer to the calf while they are holding "steady" and receiving the primary reinforcer. TTouches are performed along the head and neck region, focusing on ear work. This allows the keeper to do the TTouch while staying out of the reach of the calf's kick.

## Physical Examination and Minor Wound Care

Part of the routine husbandry regimen in caring for giraffes involves regular physical examinations to look for injuries or other abnormalities. Since keepers are able to handle the calves, thanks to the applied fusion method, they are able to palpate all areas of the body and begin inspections which include manipulating soft tissue to look for bruising, swelling, tenderness, heat, and minor wounds.

Keepers likewise utilize tools that would typically be associated with a visit from the veterinarian during daily training. Stethoscopes are used to monitor respiration, heart rate, and gut sounds during each exam. Periodically, additional items such as ottoscopes, ophthalmoscopes, penlights, dental tools, rubbing alcohol, syringes, catheter extension sets, and other medical paraphernalia are incorporated into training sessions to help the calves become accustomed to their use. During a training session, these objects are held by keepers as they perform TTouches as a secondary reinforcer. The giraffe receives a primary food reinforcer for holding a "steady" and the items are gradually moved closer until they are pressed against the body. Once the giraffe calf is at ease with the tool, in-depth training takes place to use the equipment for its intended purpose.

### Stethoscope Training:

Using the stethoscope, keepers can listen to the heart, lungs, and digestive activity of the giraffe. When an animal is ill, an established baseline for these functions has been provided for comparison. As with all training, the calf is asked to hold a "steady" throughout the process. Starting near the back of the scapula, Clouded Leopard TTouches and Python Lifts are initially performed randomly in that area of the body in unconnected lines. Clouded Leopard TTouches, where the pads of the fingers are used to make circular touches over large muscled areas, are used to acclimate the giraffe to being manipulated. Python Lifts, using the entire palm-side of the hand to slowly lift the skin over the muscle and then gently lower it, simulates the pressure necessary to accurately detect vital signs with a stethoscope. As the animal settles, the TTouches are performed in connected lines along the chest, flank, and abdomen – those areas that will be felt under the bell of the stethoscope. The TTouches are done with one hand while the stethoscope is held in close proximity to the body. If the animal does not have an adverse reaction, it is moved closer until the stethoscope is touching the giraffe calf. If at any point the giraffe does react, keepers take a step back and calm the animal with TTouch before moving forward again. Often times, TTouch is continued while the stethoscope is used until the animal is completely at ease with the use of the tool.

### Blood Draws:

Blood draws become necessary when animals fall ill, plasma needs to be stored or sent to another facility, or for participation in research studies. Blood can easily be drawn from the jugular vein of an un-sedated animal using operant condi-

tioning and TTouch. By using a firm pressure of four to six on the neck, the calves become adjusted to being poked as they would be during a blood draw. Food rewards are offered as the animal maintains the "steady" during the TTouch. When the animal is non-reactive to a more prodding touch, the medical equipment necessary is introduced in the same manner as the stethoscope. During subsequent training sessions, veterinary technicians assist the keepers to habituate the calf to their presence. Before moving on to drawing blood, keepers present the calf with alcohol used to sterilize the jab site. Oftentimes, giraffes react negatively to the smell of the alcohol so the calf is asked for a "steady" and allowed to smell the bottle and fluid to gauge his reaction before applying it topically. As long as the "steady" is maintained, the calf is bridged and reinforced as keepers move through the steps of cleaning the collection site as they would when incorporating any novel item into training. In order to actually collect blood, the needle is inserted to the jugular vein perpendicularly by the vet tech while a keeper performs Tiger TTouches in the area adjacent to the collection site to distract the animal from the jab. The giraffe is not actually stuck with the needle in every training session to prevent the animal from predicting a needle poke and pulling away from the keepers and vet staff.

## Radiograph Training

The ability to take radiographs without the use of sedatives or anesthesia is an instrumental part of The Oakland Zoo giraffe husbandry program. This has allowed staff to properly diagnose lameness, determine the best course of treatment, and to monitor the progress of the condition.

The most common injuries that occur are found in the lower portion of the legs and their associated joints. For this reason, the calves must be completely comfortable with having their legs and feet manipulated by the keepers. Noah's March, long strokes done slowly, are used down the entire leg and over the hoof to help reduce the calves' impulse to fidget and lift their feet. Additional TTouches are then used down the leg and along the coronary band to accustom the calves to different sensations that may occur when radiograph equipment brushes against their legs. Throughout the training session, the giraffe is intermittently bridged and given a primary reinforcer for holding the "steady."

The radiograph equipment is now introduced and the giraffe is rewarded for holding the "steady" while a radiograph plate is placed near the foot. Provided the giraffe remains calm, TTouches are used on the legs and feet as the radiograph plate is slowly moved closer until it is eventually placed against the leg. The false, or practice, radiograph machine is then presented in the exact same way as the plate. Other equipment and unfamiliar people are slowly added to the training sessions. The giraffe calf is still asked to hold "steady" while the new stimuli are introduced. Various TTouches and lifts are often used along the large muscled areas of the giraffe's body to encourage him to remain calm and relaxed as veterinary staff in lead aprons approach, extension chords are stretched along the ground, and hands encased in lead gloves maneuver radiograph plates around the animal's feet. The TTouch enhances the calf's training experience by helping him settle down, thereby making it easier for him to hold "steady" since fidgeting and kicking behaviors only occur when a giraffe is frightened and hyper-alert. After this progression of operant conditioning and TTouch, the actual picture is taken. In the past five years radiograph training has allowed the diagnosis, monitoring, and treatment of ringbone, sidebone, navicular syndrome, a fracture of the pedal bone, and degenerative joint disease of the fetlock joint. Therefore keepers feel that it is essential that all giraffe calves are prepared in the event that there is a medical emergency or the need for diagnostic care via radiograph.

## Routine Farrier Work

A giraffe's foot must be well-balanced and strong enough to support their weight. However, as giraffes grow into adulthood various factors in the captive environment such as diet, limited living space, and reduced activity levels can contribute to laminitis and other serious hoof problems. Commonplace afflictions in adulthood such as ringbone and sidebone alter the giraffe's gait and manifest themselves in the hoof anatomy. For this reason, regular training for hoof trimming is an integral part of any progressive captive giraffe husbandry program and should begin at an early age.

A hoof work training session is carried out in much the same fashion as previously described training; the calf is asked to hold a "steady" while allowing keepers to handle the lower legs and feet. Hoof trimming tools such as rasps, nippers, knives, and an electric dremmel are introduced. Familiarizing the calves with these items is accomplished in the same manner as desensitizing them to other medical paraphernalia used in routine physical exams such as the stethoscope and ottoscope. Because farrier work creates unique sensations in the giraffe's feet; for example, the rasp and dremmel send a ticklish vibration through the hoof and nippers put pressure on the foot, keepers tap on the hooves using the button end of the TTouch wand prior to any actual trimming in case the calf reacts adversely. Once the calf proves he can hold "steady" throughout the tapping process, rasps and other tools are lightly applied to the outer hoof wall and the giraffe is again asked to hold a "steady" while getting used to the new sensations.

In order to accomplish large scale trimming and inspection of the sole, the giraffe calves must be taught to either rest their foot on a hoof stand or roll their foot forward so that only the tips of their toes are in contact with the ground, enabling keepers to examine the sole of the foot. An adult giraffe cannot be forced or muscled into raising their foot; it is the fusion training of operant conditioning and TTouch that makes this behavior possible by incorporating it into their repertoire when they are young. TTouch helps the giraffe to be comfortable being handled and to be relaxed around foreign objects and people; operant conditioning gives the keepers the tools they need to clearly communicate the desired behavior to the animal, and to shape that behavior until it is perfect. Keepers use the shift commands "move up" and "back up" to place the calf's feet in the desired location, adjacent to the access hatches or in

a hoof stand. The keeper then applies gentle pressure to the dorsal side of the pastern as the verbal cue "hoof" is given. Initially the calf is bridged and receives the primary reinforcer for shifting his weight from the sole of the foot to the toe. As the training process progresses, the calf is only reinforced for bending at the fetlock so that the tips of the toes are on the ground and the sole is exposed. A "steady" is now added so that the animal remains still with the sole exposed long enough for keepers to clean and inspect the foot, and remove the unhealthy and overgrown hoof matter. The "steady" is gradually lengthened from as brief as 5 seconds to as long as 5 minutes in duration.

For certain corrective trimming procedures the giraffe's toes need to be raised off the ground in order to enable keepers to take back the length of the toes and to create a more desirable break-over point. To achieve this position the giraffe's foot must rest on the frame of one of the access hatches or in a hoof stand. At The Oakland Zoo keepers use the "Hoof If Hoof Stand" because it has a padded cradle made of rubber that is sufficiently wide enough to accommodate large feet. Getting the calf's foot in the stand is trained in a similar fashion as the "hoof" behavior only in this case the verbal cue "lift" is given. The trainer supports the weight of the leg by resting one hand on the ventral side of the fetlock joint and applying gentle pressure to the dorsal side of the pastern with the other hand. The calf is initially bridged and reinforced for permitting the keeper to lift his foot about 3 inches off the ground, with the leg flexed at the fetlock joint. As the "lift" behavior is perfected, the giraffe receives a primary reinforcer when the foot is about 8 inches above the ground. At the final stage of "lift" the calf is reinforced for allowing the keeper to place his fetlock in the cradle of the hoof stand. Just as with the "hoof" behavior, a "steady" is added to "lift" to gradually lengthen the time the foot remains in the stand.

Hoof work training allows keepers, vet staff, and farriers to maintain healthy hooves and feet in a multitude of ways such as remedying thrush with trimming and soaking treatments. Since corrective trimming is done on a regular basis to maintain soundness, calves need to be adequately prepared for a lifetime of farrier work.

## Halter Training

Anesthetizing giraffes is periodically necessary for treatment of serious injuries or other medical conditions. Due to their anatomy and physiology, anesthesia is difficult and can have fatal complications. Largely due to the weight of their head and neck, giraffes have a tendency to flip over backwards as an anesthetic drug takes effect, which can potentially cause severe injury to the animal. At The Oakland Zoo, a halter and lead rope are used to encourage the giraffe to remain in the sternal position as they fall. As anesthetic effects begin to appear, two people pull down and forward on the lead rope which makes it difficult or uncomfortable for the giraffe to fall over backwards. The Oakland Zoo giraffe keepers have successfully used this technique 11 times. For this reason, all giraffes in the zoo's collection are halter trained.

Likewise, halter training is necessary for leading exercises. This allows the calf to complete the TTEAM Confidence Course, to be prepared for trailer loading, and be safely walked by a keeper when necessary.

Before a calf can wear a halter he must be comfortable with being touched on the face. Keepers begin TTouching the cheeks, the bridge of the nose, and the poll - areas where the halter will apply pressure to their head. Llama TTouches are used because the calf is approached with the back of the hand rather than the palm, which is less threatening. The giraffe's large ears are often touched in the process of adjusting the halter and therefore TTouch ear work is done as part of the halter training process to desensitize them.

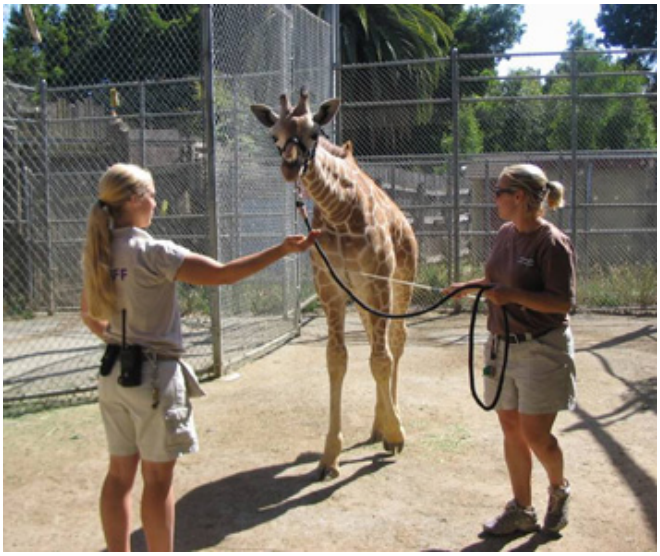
Calves are conditioned to wear halters using a "head down" behavior. With giraffes, as with equids, a posture with a high head and wide eyes is indicative of a hyper-alert state. This means the giraffe is prepared to either fight what they perceive to be a predator, or flee from it. As TTEAM instructs, lowering the giraffe's head changes both their posture and their mind set. A lowered head signifies a relaxed musculature and calm state of mind. The lower the giraffe's head, the less height, extension, and force the animal can put into a kick with the forefeet. Lowering the head makes it safer for the trainer to work in such close proximity to the calves' feet. The "head down" behavior is accomplished by offering a feed bucket that is hung low on the fencing or held by a second trainer so that the calf must bend down to reach the food. If the head needs to be slightly lower, the trainer can make Clouded Leopard TTouches on the crest of the neck and the poll until the head reaches the desired position.

The halter training process begins with desensitizing the calf to the mere presence of the halter by hanging it adjacent to a bucket of sweet feed. Once the calf is comfortable with the halter's presence, it is then placed inside the feed bucket. This requires the calf to put his muzzle through the halter in order to access the food. Once the calf is at ease with this step, the halter is held a short distance above the feed bucket and the giraffe must push his head through the halter in order to reach the food. As the calf becomes further desensitized to both the halter and human touch, the length of time that is taken to adjust the halter, or attach a lead rope, increases. The keeper can now place the head stall of the halter behind the ossicones and ears and make any necessary adjustments. Clouded Leopard and Bear TTouches, pressure and contact made with the fingernails, are done under and around the nose band and head stall of the halter to ease the stress associated with first wearing it.

## Leading Exercises

Once the calf is comfortable wearing the halter, a 2-foot rope lead is attached to allow calves to get used to something hanging from the halter, pulling on the nose-band, and causing additional pressure on the head and face. As with the adult giraffes, Lying Leopard TTouches are done underneath the halter and around it to help the calf become comfortable with the sensation and Noah's March is performed on the neck

to keep the calf calm. A 6-foot lead rope is then used to begin actual leading exercises; this length allows keepers to maintain

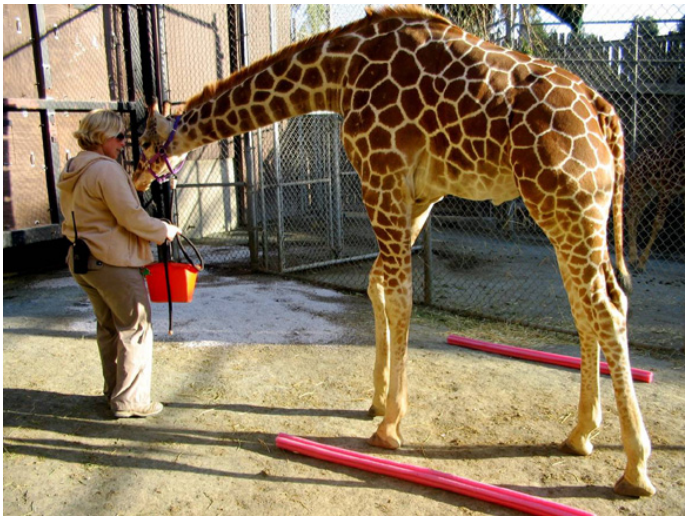


a safe distance between themselves and the animal while still retaining control with the wand.

Due to the dangers of working with a wild animal, many of the leading positions and exercises are closely related to the TTEAM work but adapted to ensure keeper and animal safety. One keeper directs the calf with the lead rope and wand while a second keeper provides back-up and administers the primary reinforcer on a fixed schedule. Food is offered every three to four steps to encourage forward progression. A reinforcer is also given for stopping on cue. Keepers begin by teaching the calf how to respond to the wand and voice commands of "walk" and "whoa." Aligned with the calf's shoulder, keepers stand two to four feet away, holding the lead rope in one hand and the wand in the other. Initially the wand is outstretched in front of the calf and the cue "walk" is given. The keeper providing food offers the treat to initiate movement. Once the command is learned calves are no longer baited to get them started and instead must respond to the cue in order to be bridged and reinforced. As the wand is swept down in front of the calf and pressed to the chest for "whoa," a soft tug back and down on the lead rope instructs him to stop. The goal is to be able to start and stop the calf without putting pressure on the halter.

## TTEAM Confidence Course

A limited form of the TTEAM Confidence Course is applied to protect keepers should the calf spook, bolt, or trip while working. A simplified Labyrinth, with wider turns and corners created out of soft foam pool noodles, carefully teaches the calves to step over objects in their pathway. Additional pool noodles are held aloft while walking the course to reduce the fear of foreign objects and having things overhead as giraffes are unfamiliar with having anything higher than themselves and often startle when anything passes over their heads or backs.



Calves are moved through the Course using the techniques learned during basic leading exercises and the system of reinforcement is the same.

Calves that can complete the Confidence Course are less likely to startle when faced with roadblocks and objects on the ground around them (especially unfamiliar items such as trash and debris). For exhibit animals, the improved coordination that comes from learning to navigate tight turns and step over objects reduces the risk of injury to the animal. The ability to lead the calves through the obstacles of the Confidence Course makes them safer animals to walk in difficult situations including trailer loading, returning animals to holding yards in the event of escape, or during evacuation in an emergency such as a natural disaster.

## Conclusion

Both keepers and giraffes at the Oakland Zoo have benefited from this fusion system of training, not only through an improved relationship but in the ability to attain complex and unusual behavioral goals. Adjunct to those training accomplishments described previously, staff members bathe and groom the animals, apply cold therapy boots and shoes, wrap the leg joints, administer laser therapy and acupuncture/acupressure, condition the hooves with topical remedies, rub on topical NSAIDs, perform mock dental examinations, drop ophthalmolic washes and ointments into infected eyes, inject necessary medications via pole syringe or hand injection, and perform transabdominal ultrasounds. Most importantly, keepers are not forced to work with the giraffes based around flight distance - mutual cooperation is obtained and this congruent relationship is the key to the success of the program.