

Introducing operant-based behaviour training for Giraffe at the Assam State Zoo

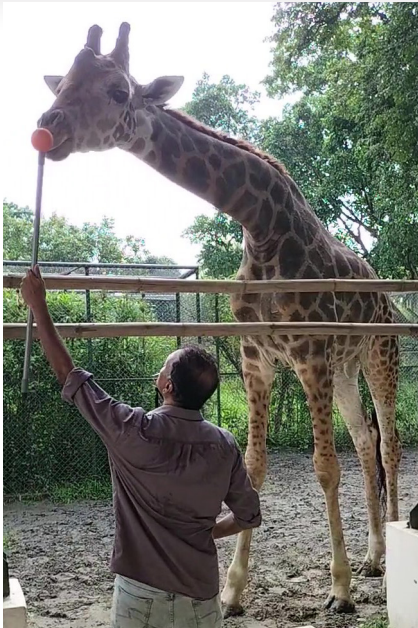
Giraffes (*Giraffa* spp.) are widely housed in zoos because of their charismatic appeal and popularity among visitors. However, their tall stature, unique anatomy, heightened vigilance and avoidance behaviour unfamiliar to veterinary equipment or procedures pose distinct challenges for medical care in zoos (Dadone 2015). Zoos around the world are increasingly adopting behavioural training programmes that use positive reinforcement-based operant conditioning to encourage voluntary Giraffe participation in medical care, with documented successes at Cheyenne Mountain Zoo (Dadone 2015; Dadone et al. 2016) and Dubai Safari Park (Booth et al. 2022). Positive reinforcement training (PRT) encourages animals to willingly participate in procedures that are often perceived as aversive, such as veterinary treatments or transport, by rewarding desired behaviours (Brando & Norman 2023).

In recognition of this, a pilot behavioural training program based on voluntary participation and positive reinforcement training (PRT) was implemented with a six-year-old male Giraffe, Vijay, at the Assam State Zoo (ASZ) in India between August and October 2024. This is the first such initiative undertaken for Giraffe at the ASZ and the first to be documented for Giraffe in Indian zoos.

A restricted-contact training setup, as described by Dadone et al. (2016), was created by modifying an existing secondary exit in the Giraffe building, where sliding and removable bamboo barriers were installed to provide

a flexible training space. The adjoining yard remained open so that Vijay could voluntarily disengage from the session if desired. All sessions were conducted under strict safety protocols. The training tools used included a brightly coloured ball affixed to a stick, which served as the target, a whistle as the bridging stimulus (a consistent sound used to mark the exact moment a correct behaviour occurred), and food rewards (apple, carrot, and leaf lettuce), identified through preference assessments, were used as reinforcement.

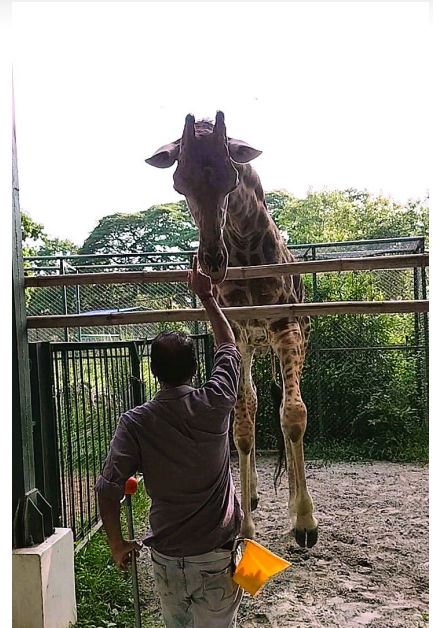
The training team consisted of the primary trainer and two keepers. Each session was conducted by the primary trainer in coordination with one of the keepers. Training sessions were conducted four to five times per week between 1500 h and 1600 h, lasting approximately 15–20 minutes each. Prior to each session, the primary trainer briefed the participating keeper on the session objectives and procedural flow. Mock rehearsals were conducted when necessary to ensure consistency and preparedness. Where possible, sessions were held during best environmental conditions – minimising visual and auditory distractions and ensuring appropriate weather (no rain or drizzle) – to enhance the likelihood of desired behaviour occurring (antecedent arrangements). Vijay's temperament was assessed before each session to confirm a relaxed state, indicated by his attentiveness to the trainer, relaxed ear posture, and absence of flared nostrils and lack of eye tension (e.g., widened eyes or visible sclera). Post-session reviews were conducted to evaluate



Target touch



Recall and station



Back-up



Foot on the board



Hoof touch and rub (a)



Hoof touch and rub (b)



Neck touch and rub



Neck poke

Goal behaviours performed by Vijay. © Tushar Kulkarni.

Table. Summary of Goal Behaviors Taught to Vijay and Sessions Required for Establishment

	Goal behaviour	Description	Sessions to establish
1	Target touch	Vijay touches the target on cue, marked by a whistle and followed by reinforcement.	4
2	Recall and station	Vijay approaches the trainer on cue and stands at the training area.	5
3	Back-up	Vijay steps backward on all four legs on cue, without turning.	8
4	Foot on the board	Vijay lifts his forelimb and places it onto a wooden board (60 × 40 × 1.8 cm) on cue.	10
5	Hoof touch and rub	Vijay allows tactile interaction with his hooves, including touching and gentle rubbing, on cue while maintaining his forelimb on the board.	8
6	Neck touch and rub	Vijay allows tactile interaction and hand movements along his neck on cue while maintaining its position.	9
7	Neck poke	Vijay tolerates graduated tactile pokes at venipuncture sites on his neck on cue while maintaining his position.	5

Vijay's responses and level of engagement, guiding adjustments to the training strategy for subsequent sessions.

Differential reinforcement of successive approximations (Pryor 1999; Peterson 2004) was used to teach goal behaviours to Vijay. Following the principle of shaping, each goal behaviour was deconstructed into smaller, manageable steps. Reinforcement was provided for responses that progressively approximated the desired behaviour, and the process continued until Vijay consistently and reliably performed the complete goal behaviour.

Vijay was trained in seven goal behaviours to build a foundation for progressively developing more complex behaviours, enabling his voluntary participation in healthcare procedures such as hoof care and blood draws. A training plan was prepared for each goal behaviour, outlining the reinforcement strategies,

incremental steps, and progression criteria to guide the shaping process. The table above summarises the behaviours taught and the number of sessions in which each behaviour was established by Vijay.

The first four goal behaviours are foundational and serve as prerequisites for the subsequent three. The 'Hoof touch and rub' behaviour can be shaped to train Vijay to voluntarily place his foot on a block of appropriate height and perform fetlock flexion (hoof curling), allowing access to the underside of the hoof for inspection, cleaning, and trimming. This behaviour also leads to stepping onto a block for foot radiographs. Similar training methods can be applied to all limbs for hoof care and radiographs. The 'neck touch and rub' and 'neck poke' behaviors prepare Vijay for future blood collection from venipuncture sites on the neck by gradually desensitizing him to increasing pressure and sensation with a blunt needle

before introducing an actual needle. Behavioural training, also known as medical or husbandry training, integrates operant conditioning with positive reinforcement into husbandry and veterinary care, is transforming the field and enhancing animal welfare and well-being (Martelli & Krishnasamy 2023). By training animals to voluntarily participate in medical behaviours, many high-risk procedures can be performed without the need for chemical or physical restraint (Callealta et al. 2019). Anaesthesia is widely recognized as high risk in giraffes due to their unique anatomy and specialised cardiovascular physiology, with historical anaesthesia-related mortality rates of 25–35% reported (Calle, 1988; Vitali et al., 2020); however, with consistent practice and experienced personnel, current-day giraffe anaesthesia shows significantly improved morbidity and mortality outcomes compared with historical trends (Swenson et al., 2025). Implementing this programme for all Giraffe at the Assam State Zoo and evaluating long-term outcomes will, therefore help establish behavioural training as a best practice and contribute to the global evidence of its value in enhancing captive Giraffe welfare and veterinary care.

This behavioural training initiative for Vijay at the ASZ demonstrated the effectiveness of positive reinforcement and operant conditioning in training a Giraffe for voluntary participation in veterinary care procedures. By integrating behavioural science into Giraffe husbandry, this initiative marks a notable advancement in Giraffe management at the ASZ.

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