Forage "Shooter": A Means to Widely Distribute Forage Materials

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Starting with the valid premise that all enrichment for captive animals should provide for species-specific behaviors, the Primate Foundation of Arizona (PFA) looked first to foraging behavior as one that occupied as much as six to eight hours of the day in the life of the wild chimpanzees (Pan troglodytes) (Goodall 1986). Therefore, opportunity to forage throughout the day should be considered an important component of enrichment provided to captive chimpanzees (Fritz & Howell 1993).

Forage materials include a wide variety of food items (see Howell & Fritz 1999) for an extensive listing) but, chicken scratch, in particular, is a favored forage material of chimpanzees at PFA. Chicken scratch is available at most local feed and seed or grain stores. The main component is crushed corn. PFA has used chicken scratch as a forage material for captive chimpanzees for well over 20 years. Chimpanzees spend hours searching for it in their straw, shredded paper, or grass bedding.

However, provision of foraging enrichment is complicated by the comparatively close quarters of captive life and the need to disperse the forage widely enough to prevent any feeding competition for animals housed in social groups (Grief et al. 1992). In an effort to solve this problem, PFA designed a forage "shooter" (Shooter) that allows us to blow forage into both empty and occupied cages and over a wide area. The system consists of a portable air tank and pvc pipe apparatus.

SUPPLIES AND EQUIPMENT

To make a Shooter you will need a 7/16" drill bit, hacksaw, and plastic welder. To use the Shooter, you will also need access to an air compressor to fill the portable air tank. Additional needed materials are:

1. one 3' piece of %" pvc pipe
2. one 16 ounce plastic spray bottle
3. one 5 gallon portable air tank
4. one ½" rubber stopper
5. one quick coupler (3/8" is standard)
6. duct tape

We were able to purchase these supplies for approximately $45.00 including the cost of the portable air tank which was approximately $38.00. The portable air tank must be filled with an air compressor which can be purchased for approximately $200.00 if one is not available for use.

To construct a Shooter, follow these general steps and see details below: (1) preparation of the pvc pipe, (2) preparation of the 16 ounce spray bottle, and (3) connecting the air compressor to the pvc pipe. If you are unfamiliar with the use of a plastic welder, drill, or other machinery, do not attempt to make this device on your own. Seek out expertise prior to initiating the project. At PFA, this device was constructed by the Colony Manager in consultation with our Chief Maintenance person (Thanks Gary Gillette!). At your facility, you may have access to an engineering or maintenance department that can be of assistance.

PREPARATION OF THE PVC PIPE

With the hacksaw, cut a 3' section of 1/2" pvc pipe.
With a 7/16" bit in your drill, drill a hole about l' from one end of the pvc pipe.

PREPARATION OF THE 16 OUNCE SPRAY BOTTLE

Examine the 16 ounce spray bottle. The spray bottle should include two parts. A spray pump apparatus and the bottle itself. These parts can be separated by unscrewing the spray pump apparatus from the bottle. There should be a threaded ring on the top of the spray pump apparatus that allows you to take the spray pump apparatus on and off the threaded plastic bottle.
Using a hacksaw, cut the pump top off in order to get the threaded ring that the bottle screws into.
Weld the threaded ring to the pvc pipe with the opening directly over the 7/16" hole drilled earlier (see Figure 1). If you have done this correctly, you can screw the 16 ounce plastic bottle on and off the pvc pipe apparatus.

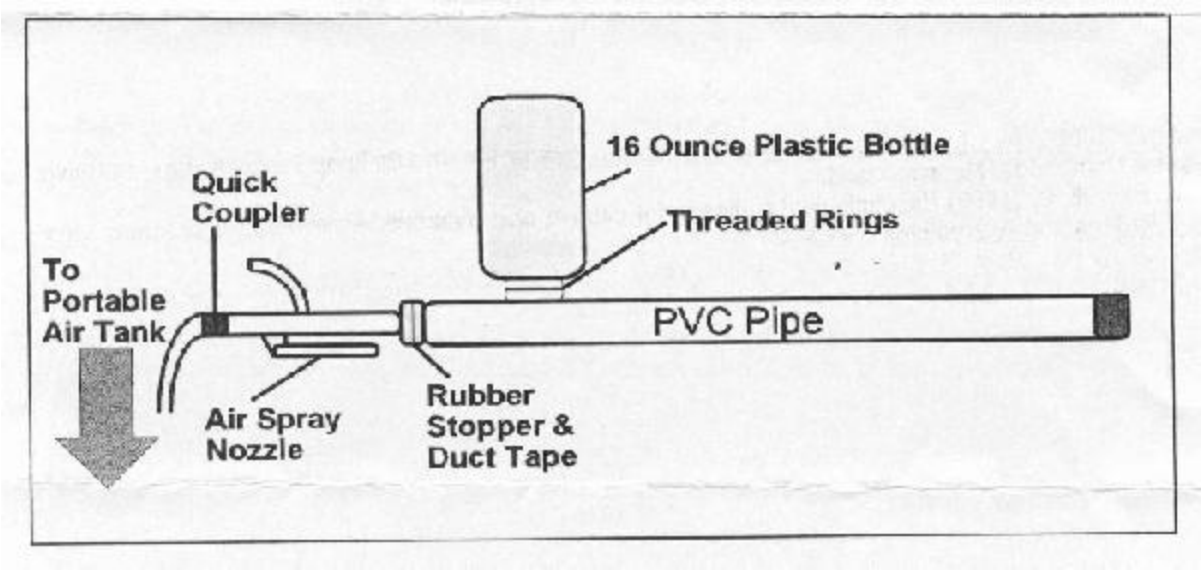

Figure 1. Diagram for Forage Shooter

CONNECTING THE AIR COMPRESSOR TO THE PVC PIPE

1. Be sure the portable 5 gallon air tank is filled with compressed air.
2. Insert the air compressor nozzle into the end of the pvc pipe nearest the plastic bottle.
3. Use the rubber stopper to hold the air compressor nozzle securely into place.
4. Wrap duct tape around the nozzle to be sure the air compressor spray nozzle is tight in the pvc pipe.
5. Attach the 5 gallon portable air tank to the air compressor spray nozzle with the quick coupler.

If you have assembled this correctly, the portable air tank will be connected to the pvc pipe via an air spray nozzle and quick coupler. See Figure 1 to be sure you have assembled it correctly.

To use the forage shooter, unscrew the plastic bottle and fill it with the forage of your choice. We allow 1/4 cup/50mL of chicken scratch per animal. Press the air spray nozzle to blow the chicken scratch: The apparatus is designed to blow chicken scratch up to a 20' radius. As a result, chicken scratch can be dispersed into an enclosure without shifting the animals out of the area.

It is important to take precautions when using this device. Do not aim the apparatus directly at a chimpanzee (or human!). While it would pose little health risk to the chimpanzee, it would frighten them. Modification of this design is needed to use it with larger forage material (e.g., dry cereal or sunflower seeds).

We have used the forage shooter at PFA for the last year. It replaced a similar device we constructed from a "shop vac." We prefer this newer device because it is smaller, light-weight, and quieter than the shop vac. The chimpanzees quickly acclimated to it. It is an effective device for providing and dispersing forage for animals housed in large indoor/outdoor social groups.

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