INTRODUCTION

Within the family Canidae, determination of minimum husbandry needs of medium (20-35 lb/9-16 kg) and large (over 35 lb/16 kg) species is variable because of differences in size, morphology and behavior. In this discussion, medium or large canids are defined as any species of canid belonging to the genus Canis, including the side-striped jackal, Canis adustus; golden jackal, C. aureus; black-backed jackal, C. mesomelas; Simian jackal, C. simensis; coyote, C. latrans; red wolf, C. rufus; dingo, C. familiaris dingo; gray or timber wolf, C. lupus; domestic dog, C. familiaris (and timber wolf x dog hybrids); as well as the dhole, Cuon alpinus; maned wolf, Chrysocyon brachyurus; and African wild dog, Lycaon pictus.

All canid species are cursorial. In addition, all canid species form a pair bond which is an exclusive male/female association during the breeding season. In canids, the pair bond usually extends throughout the pup-rearing period. These two factors make most species of canids particularly susceptible to the development of stereotypic, abnormal behavior such as pacing when confined to small enclosures or when isolated from conspecifics. Modern methods of contraception and the fact that canids are seasonally monestrous make it relatively easy to house male/female pairs together for most of the year, even when reproduction is not desirable. Care must be taken in the design of all housing, however, to insure that animals cannot escape or dig out. Caution should also be exercised when handling otherwise "tame" individuals.

GENERAL REQUIREMENTS

Some aspects of captive management for all medium and large canids are similar and discussed below. Requirements unique to certain groups are listed separately. Temperature: Although medium and large canids originate from all manner of climates, most species are tolerant of broad temperature extremes, at least during daylight hours. Animals kept outside should always
have access to shade, especially during warmer parts of the year. When acclimated, most species without young only require minimal, unheated shelters at night; in cold climates, wooden pallets should be provided for sleeping to prevent the loss of body heat. Dens should be dry, small, and cramped. If animals are given spacious dens, smaller "hide" boxes should also be provided. These smaller boxes enable individuals to retreat or fend off conspecifics. When breeding is a possibility, a separate den or hide box should be present for each pregnant female. All artificial shelters for tropical species should have a space heater for use in winter. Most temperate zone canids are well adapted for winter weather although supplemental heat

Minimum Husbandry Guidelines for Mammals: Canids, Medium and Large AZA Mammal Standards Task Force, 1997 encourages females to give birth within the den area. It also provides a warm dry area regardless of the rest of the enclosure. In spacious enclosures, canids often dig several extensive subterranean dens.

**Lighting:** Natural lighting is optimal for all species of canids. When needed, fluorescent lighting is an efficient light source for full-spectrum illumination. Ventilation and Humidity: Indoor exhibits should have a negative air pressure, with a regular air change of non-recirculated air. Relative humidity should be within the range of 30-70%. Separate air handling systems should be maintained between the visitor and animal exhibit area to prevent possible disease transmission and complaints about odor.

**Water:** Fresh clean water for drinking should be available at all times. Watering devices should consist of either built-in devices or sturdy portable containers. Regardless of size, water containers should be cleaned and disinfected daily. Some canids enjoy bathing and swimming, and pools should be incorporated into outdoor enclosures, space permitting.

**Sanitation:** Hard-surface enclosures, pallets, and food containers (if used) should be cleaned daily with detergents and disinfectant. Dirt substrates in outdoor exhibits should be raked and spot-cleaned daily. Foot baths should be used prior to entering and exiting all canid enclosures or areas containing enclosures. Each should be filled with a disinfectant and its use strictly adhered to by all personnel.

**Enclosure dimensions:** Enclosure sizes vary according to species and social group. As a general rule, a single large canid should have an enclosure measuring at least 10 ft. (3.1 m.) x 15 ft. (4.6 m.) or 150 sq.ft. (14 sq.m.). For each additional animal, the enclosure should be increased by 50%. A single medium canid should have an enclosure measuring at least 8 ft. (2.5 m.) x 12 ft. (4.7 m.) or 96 sq. ft. (9 sq. m.). For each additional animal, the enclosure should be increased by 50%. Barriers: Perimeter barriers should be least 8 ft. (2.5 m.) high and include an inward facing overhang, the top
protected by either electric cable or a 45-degree overhang. In addition to vertical barriers, all perimeters should also have either a concrete footing or horizontal protective mat around the entire enclosure. Most medium- and large-sized canids are prolific diggers and can easily tunnel under a chain link fence. Where feasible, enclosures should be designed without square corners. Food: Medium and large canids are easily maintained when fed commercially- or custom-made diets. Commercial preparations containing all necessary vitamin and minerals are readily available, or may also be custom-made by the holding institution. On a daily basis, canids require 1-3 kg. of high quality, low-fat diet per 25 kg. of body weight. Whole animals used as feed should be limited to freshly killed carcasses, and should be removed at regular intervals. Diets containing high percentages of fowl, and especially ones containing chicken or turkey necks, should be avoided due to inadequate levels of calcium and phosphorus. The quantity of rations fed will also depend on individual condition and whether or not feeding is communal or done on an individual basis. Where communal feeding is practiced, weights of subordinate animals and juveniles must be closely monitored. Obesity also occurs where communal feeding is practiced, and fasting all members one day a week may be used for weight control. Milk substitutes used to hand rear infants should be specifically formulated for canids. Milk replacers should contain low levels of lactose to prevent eye problems.

Veterinary Care: Services of an experienced veterinarian should be available to all holders of non-domestic canids. When circumstances permit, an overall examination should be performed annually, and blood samples collected, serum banked as a baseline control, and the results recorded. Fecal examinations should be made twice a year to check for parasite infestation. Infant canids are especially susceptible to parasite infection and should be screened monthly during their first six months. Routine deworming with a broad spectrum antihelminthic at six and eight weeks of age is highly recommended. Preventative heartworm medication should be given to all canids housed in areas where this parasite is prevalent, and an occult heartworm test performed annually.

All canids should receive annual prophylactic vaccinations for protection against canine distemper and parvovirus; modified live virus (MLV) products should be used. For protection against rabies, wild canids should be vaccinated with a killed virus (KV) product. Vaccination for leptospirosis, parainfluenza, and hepatitis is not generally required but if deemed necessary, should be given, and from KV products only. If MLV products are used for vaccination, vaccine-induced cases of these diseases may result.

Fleas can be a problem in some areas and should be controlled by spraying the enclosure with an approved commercial insecticide.
ADDITIONAL LITERATURE


