

## **Mexican Wolf Husbandry Manual**

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### **V. Nutrition**

#### **A. General Considerations**

Mexican wolves must be provided with adequate quantities of fresh, high quality feeds and should have access to clean drinking water at all times. Body weight and daily feed consumption records should be maintained on all animals. Care must be taken to provide a diet of consistent composition. Change for any reason should be made gradually; this is of particular concern when transferring animals between facilities. The following are general guidelines; individual animals and situations need to be taken into account when designing diets and feeding routines.

#### **B. Nutritional Requirements and Principal Diet**

Nutritional requirements for Mexican wolves have not been thoroughly studied but are assumed to be similar to those of the domestic dog. Nearly all of the Mexican wolves currently held in captivity are fed dry dog foods such as Ralston Purina Pro Plan™ (Ralston Purina Co., St. Louis, MO 63188) or Hill's Science Diet™ (Hill's Pet Nutrition, Topeka, KS, 66606) should be fed. Such meat-based diets are high in digestibility and are less likely to result in digestive upsets and diarrhea associated with high cereal diets. Low quality "budget" dog foods should not be used due to uncertain control of nutrient concentrations and ingredient digestibility.

Concern has been raised that feeding dry dog food may contribute to stomach torsion in Mexican wolves, and some veterinarians recommend that dry feeds be soaked prior to feeding. Stomach torsion has minimally been a cause of death in Mexican wolves, but many facilities have fed dry dog food to wolves for years without problems, and no studies have established a cause and effect relationship. Soaking dry dog food also softens it and destroys the physical characteristics that make the dry product beneficial for teeth cleaning and oral health. Some feel stomach torsion is related to pacing and strenuous exercise when the animal's stomach is full, so care should be taken not to run or excite wolves for at least two hours after eating. Chronic low-level stress again may be a factor resulting in nervous upset.

Adult Mexican wolves weighing 22 to 32 kg should be fed approximately 1,300 to 1,800 kcal metabolizable energy (ME) per day for maintenance in a thermoneutral environment with moderate activity. This amount of ME would be supplied by 18 g of good quality dry dog food (3.3 kcal ME/g) per kg of body weight. Energy requirements will vary with climate, activity level, and individual animal. Good quality protein should make up at least 20 to 25% of wolf diets, and fat levels should be at least 5% (dry weight basis).

No more than a three month supply of the diet should be purchased at one time; and it should be stored in a cool, dry place to ensure that it will be fresh and free of rancidity.

Vitamin and mineral deficiency or toxicity is extremely rare in wolves fed a high quality, scientifically prepared diet. Nutritional imbalances in Mexican wolves are most likely to be caused by feeding a diet consisting wholly of organ or muscle meats. Such diets are very low in calcium and have significant deficiencies or imbalances of other nutrients.

Nutritional requirements for growing animals and pregnant and lactating bitches will be significantly higher than for maintenance and will be discussed later.

### C. Supplemental Feed Items

If a high quality, meat-based dry dog food is used as the principal diet for Mexican wolves, supplements are unnecessary. Feeding large quantities of supplemental items such as prepared meats or carcasses is not recommended.

Prepared meats like Nebraska Brand™ Canine Diet or Feline Diet (Animal Spectrum Inc., North Platte, NE 69103) are commonly fed as a supplement to dry diets. These highly palatable diets can be fed as treat items and are a useful vehicle for administering oral medications, such as wormers, and as an enticement to enter buildings or crates. Care should be taken not to feed these items in high enough quantity to interfere with the balanced composition of the principal diet. Special care should be taken not to overfeed Nebraska Feline Diet because its high fat content and caloric density (1,260 cal/lb as fed compared to 875 kcal/lb as fed for canine) can lead to obesity.

Beef or horse shank and knuckle bones are often fed to captive Mexican wolves. These are valuable environmental/behavioral enrichment, promote good dental health, and may aid in strengthening cranial muscle and bone. Softer bones such as horse tails and chicken necks are also fed by some facilities. While some veterinarians caution against soft or small bones because of choking and splintering, others believe soft bones are an important calcium source, especially for growing animals and pregnant and lactating bitches. On the Mexican wolf husbandry survey, no facility reported problems related to feeding soft bones.

Dietary vitamin and mineral supplements such as Pet Tabs are fed by some facilities but do not appear to be essential for normal animal maintenance if a good quality diet is fed.

Carcasses such as rats, rabbits, chickens or fetal calves may be important for animals to be released to the wild; however regular feeding of carcasses to animals that are to remain in captivity is not recommended due to an increased risk of exposure to pathogens.

### D. Feeding Practices

Adult Mexican wolves can meet their maintenance requirements by feeding once a day. Pairs or groups need not be separated for feeding, but enough separate feed stations should be provided to insure that dominant animals do not monopolize feed. Many facilities report feeding their wolves in shift or holding areas which has the advantage of providing privacy and of conditioning animals to

these areas. Care must be taken to insure that conditioning the animals to an area does not include conditioning or acclimation to the keepers. Feed – give access – then leave.

Wolves should be fed approximately one-half hour prior to the end of the work day. Most wolves are reluctant to approach a feeding station when personnel are present in the area. Food left out (because wolves won't come up to eat it) is subjected to environmental factors, animal vectors (birds, ant, etc.), and spoilage.

Mexican wolves may be fasted one day per week. Bones are often given on fast days. The day following a fast is a good opportunity to give oral medications or to use feed to entice wolves into holding pens, buildings, or crates. Fasting is not recommended for growing animals, pregnant or lactating bitches, or in cold weather.

#### E. Nutrition and Reproduction

Good nutrition is essential to successful breeding and pup rearing. Two facilities that have had good success breeding Mexican wolves begin reproduction-related diet changes near the beginning of estrus as indicated by the pro-estrus bleed. In one case, the amount of dry dog food is increased; the other facility adds Nebraska Brand <sup>TM</sup> Canine Diet at this time.

Pregnant bitches have energy requirements approximately 30% higher than maintenance requirements during the last third of pregnancy. Lactating wolves need two to three times the energy needed for maintenance. A high quality, energy dense diet must be fed at these times. Female wolves with these high nutritional needs cannot eat a large enough quantity of poor quality diets to meet their needs. Frequency of feedings should be increased to two to three feedings a day during these high demand periods. Pregnancy and lactation also increase daily requirements for nutrients such as protein and calcium, but increased food consumption to meet energy needs automatically increases intake of these nutrients. Therefore, supplementation of a properly formulated diet with minerals and vitamins, if necessary, and, unless done properly, may cause more harm than good.

As Mexican wolf pups mature and are weaned, the female will continue to feed them by regurgitating food to them. Mixing dry dog food with ground meat like Nebraska brand <sup>TM</sup> Canine Diet gives the diet a better consistency for regurgitation feeding. Dry dog food tends to be regurgitated as a soft mush; addition of ground meat solidifies the regurgitated mass, allowing pups to pick it up and carry it to the den or other secure location. Growth energy requirements for pups are roughly twice maintenance requirements. Minerals and vitamin supplements are unnecessary and, if used incorrectly, may be harmful.

#### F. Hand-Rearing Guidelines

As a rule of thumb pups are only removed for hand-rearing in extraordinary circumstances and with prior approval of the USFWS. The genetic value of the pups will need to greatly outweigh the domesticating influences of hand-rearing.

If the pups are removed before they have suckled, they will not have received any passive immunity from their mother's first milk. The pups need to be provided with their passive immunity, and this can

be done in two ways. First, the mother can be milked for her colostrum, which then can be fed directly to the pups. Second, 3 cc to 5 cc of mother's blood serum can be injected subcutaneously to each pup. The serum can be administered a few days after they have received their colostrums or twice the first week if colostrums is not available.

The pups should be fed an unmodified Esbilac formula. The amount of formula fed per twenty-four hour period should total about 20% of the pup's body weight. For example, a 700 g pup should receive 140 g or 140 ml of formula, divided into several evenly spaced feedings, per twenty-four hour period. A regular human infant nipple works well. Heat only the amount measured for each feeding to body temperature. At three weeks of age begin to offer milk-soaked puppy chow, and then wean them from the bottle.

Until the pups are at least twenty-one days old, they should be kept in an environment above 85°F (29°C). A pup's rectal temperature should be about 100° – 101° F (37.8° – 38.3° C).

Document the feeding schedule, the amounts of formula offered and taken at each feeding, the stool condition, and daily weights. Vaccinate according to the schedule.