Zutrition: analyzing and evaluating diets fed to captive mammals at Capron Park Zoo

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Abstract

Zoos provide both educational and recreational opportunities for the general public to learn about animals found in a variety of habitats around the world. A successful zoo must provide a safe and enjoyable environment for the visitors, in addition to the species living within the enclosures.

Animal husbandry and health are crucial aspects to which zoo keepers must pay attention, as they have a responsibility to attempt to approximate the captive species’ natural habitats and life histories. An essential part of maintaining a captive zoo animal’s health and wellbeing is providing the animal with an appropriate diet. In addition to supporting the animal's physical health, a good diet can be used to provide stimulating enrichment to captive wildlife.

Food is one of the most commonly used forms of enrichment provided to captive animals in order to stimulate mental problem solving, foraging, and even hunting behaviors that would normally be exhibited in the wild. Good nutrition is also critical in order to prevent many diseases in captive animals, as they would likely not be at risk of developing if they were living in their natural habitat. To provide the animals a properly balanced nutritional meal plan, both qualitative and quantitative measures must be considered in the selection of food. Creating proper proportions of the most commonly used forms of enrichment provided to captive animals in order to stimulate mental problem solving, foraging, and even hunting behaviors that would normally be exhibited in the wild. Good nutrition is also critical in order to prevent many diseases in captive animals, which they would likely not be at risk of developing if they were living in their natural habitat.

Factors That Affect Diet Formulation

Aspects that must be considered when assimilating natural diets to captive settings:
- Adjusting nutritional requirements based on activity in captivity
- Guaranteeing essential nutrients, vitamins, and minerals
- Having an in-depth knowledge of diets consumed in the wild
- Ensuring the accessibility and affordability of foods in captivity

Objectives

The objective of this project is to analyze, evaluate, and modify the pre-existing diets fed to mammals at Capron Park Zoo and create a hard-bound diet manual to be implemented for daily use.

Pre-existing Conditions/Diseases

Diabetes Mellitus:
Present In: Ring-Tailed Lemur
What Is It? A decrease in metabolic rate due to suppression of secretion of thyroid hormone.
Clinical Signs: Thinning of hair, dry, scaly skin, dull hair coat, weight gain, and low body temperature.
Diet Accommodations? Low fat and protein, and oral thyroid replacement hormone of T3 or T4.

Hypothyroidism:
Present In: Sloth Bear, North American River Otter
What Is It? A decrease in metabolic rate due to suppression of secretion of thyroid hormone.
Clinical Signs: Thinning of hair, dry, scaly skin, dull hair coat, weight gain, and low body temperature.
Diet Accommodations? Low fat, low protein, and low carbohydrate diet.

Inflammatory Bowel Disease:
Present In: DeBrazza’s Monkey
What Is It? A chronic inflammatory gastrointestinal disorder, leading to thickening of the GI tract and a decrease in function.
Clinical Signs: Weight loss, diarrhea, vomiting, and lethargy.
Diet Accommodations? High fiber, low fat, low carbohydrate diet.

Pre-existing Conditions/Diseases

References


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Anatomical Variations in Gastro-Intestinal Tracts

Carnivore (Serval) Herbivore (Reeve’s Muntjac)

Stomach Smal intestine Hindgut

Omnivore Diet (Sloths)

Sloth Bears (1.1)
Bear Mix Ratio: 2 Propac Dog Food: 1 Laboratory Primates Biscuits

Daily Per Bear:
2 kg Bear Mix
12 g Ground Flax Seed
70 g Apple or Melon
70 g Tomato or Kiwi
70 g Cooked Sweet Potato
70 g Grapes
70 g Pear
50 g Banana
50 g Orange or Pineapple

Sunday Only:
100 g Hard Boiled Egg
Supplements:
Daily for First Full Week of Each Month:
40 g Horse Bran
Daily:
2 g Equine Coarsein w/ MSM on Food

Herbivore Diet (Red Kangaroos)

Red Kangaroos (5.1)
Free Choice Grass Hay
PM:
350 g Herbs and Veg Mix
75 g Monkey Chow
MWF/So: 75 g Raw Carrot, 250 g Apple
TThSa: 500 g Raw Sweet Potato, 350 g Leafy Greens, 2 Alfalfa Blocks
Supplements:
Daily: 5 g Vitamin E
For First Full Week of Each Month:
10 g Horse Bran

Samples of Captive Mammal Diets

Carnivore Diet (African Lions)

Lions (0.2)
Daily Exempt Sunday – 1.75 kg Bravo
MWF: 325 g Beef Heart
TThSa: 3 Chicken Quarters
Su: 1 Bone
Supplements: (Once a Week on Monday) – Naela and Kaela: 2 Tbsp Laxatone

Lion (1.0)
Daily Exempt Sunday – 3 kg Bravo
MWF: 250 g Beef Heart
TThSa: 3 Chicken Quarters
Su: 1 Bone
Supplements: (Once a Week on Monday) – Ramzes: 2 Tbsp Laxatone

Anatomical Variations in Gastro-Intestinal Tracts

Left: Source: Ben Eichelberger Right: Mentor: Dena Kaiser, 2009

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To provide the animals a properly balanced nutritional meal plan, both qualitative and quantitative measures must be considered in the selection of food. Creating proper proportions of the most commonly used forms of enrichment provided to captive animals in order to stimulate mental problem solving, foraging, and even hunting behaviors that would normally be exhibited in the wild. Good nutrition is also critical in order to prevent many diseases in captive animals, which they would likely not be at risk of developing if they were living in their natural habitat.

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