

# Integrated Zootrition

(Feeding Management & Nutritional Assessment Software)

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## Vision and Mission

Development of an integrative, online animal feeding management system targeted for wildlife species to be used by zoos and aquariums, (research) institutions, educational institutes and other interested global partners; suggest the existing Zootrition™ program can be used as starting point.

## Goals

- Improvements to diets fed, resulting in healthier zoo animals, which saves costs (reduction in veterinary costs estimated, on a global scale, at \$10-20 million USD annually)
- Improvements in food purchase, inventory, and distribution systems in zoos which also saves globally at least 20 million dollars
- More economic diet formulation (estimation of reduced annual costs in zoos 35 to 55 million dollars (1000 zoos, annual food budget averaging \$200.000, with at least 10 % cost reduction through diet assessment, less preparatory work, less wastage)
- Improved behavioral enrichment, incorporating food rewards into overall diet evaluations, which also contributes to overall wellbeing of zoo animals
- Improved knowledge on various aspects of zoo animal nutrition through education of zoo staff and students

## Introduction

There is no globally standardized zoo animal nutrition program available at the moment for diet evaluation to be used in zoos. The Dutch Zoo animal Nutrition Group (NVD-voedingsgroep) as a part of the Dutch Federation of Zoos (NVD) took the initiative to investigate if a zoo nutrition program could be developed which could be used in all zoos. After discussion with the owner of a major zoo diet records keeping and assessment tool currently in use globally (Zootrition), design of an advanced integrative zoo nutrition program is proposed, based in part on the existing software and database structure. At the moment contacts are made with several groups like the AZA Nutrition Advisory Group, the Comparative Nutrition Society, the EAZA Research Group and European Nutrition Group. Already the EAZA Research Group and ENG are supporting the concept; others will follow.

## **Integrated Zootrition**

### **1. Content of the suggested program**

A new web based zoo animal nutrition program should consist of several modules.

Modules could be used as standalone programs, as well as cooperatively:

- **Purchasing module**

This module should have the possibility to connect with the available administrative modules currently in use within various zoological facilities. It should contain food storage, diet preparation, and logistics/distribution components. A current example of such an existing program developed by the Dutch IT company Kjerner could be included or be used as a starting point for this aspect.

- **Diet and diet evaluation module**

This module comprises the main part of the program and contains several components including: diet nutrient analysis, diet storage and ingredient exchange, energy calculation, updated mondial and/or regional databases of foodstuffs/ingredients, animal requirements, body condition scores, fecal scores, diet cards or reports, integration with zoo animal food manufacturing product descriptions, integration with Species 360 or other animal inventory programs for individual animal records, as well as contain an extended nutritional education component.

- **Information exchange with ZIMS**

Nutritionally balanced diets form a basic foundation of animal health. It is critical that adequately detailed dietary software integrates with veterinary records such that nutritional linkages (diets and biomarkers of nutritional status) can be established, documented, and evaluated for better understanding impacts/effects of nutrition on animal health.

### **2. Proposed Non-profit organization**

A non-profit Foundation should be established with a goal of creating and curating standardized inputs and outputs of the envisioned Integrated Zootrition program. A structure with rotating Chair, Secretary and Treasurer positions is suggested, with a global advisory board comprising individuals from organisations which actively support the goals of the established Foundation.

The main task(s) of the whole group would be:

- Finalize in detail the planning of an Integrative Zootrition program and outline criteria for interface with Species 360, ZIMS and possibly other programs; develop and distribute RFP (Request for Proposal).
- Review proposals and select an IT development company for creation of the overall system, based on global consensus.
- Set up a system to support ongoing diet evaluations, as well as a review/curatorial process to provide regular updates of food composition and nutrient requirement databases, develop education modules and identify assessment criteria to be incorporated within the Integrative Zootrition program.
- Other tasks as identified/defined.

### **3. Finances**

Suggested is that a limited demo/instruction program should be freely available without support.

The overall aim is to develop, distribute and maintain the enhanced program free of charge to all users through sponsored funding. At the moment, initiatives are being taken to budget creation of the proposed program. The predicted full cost of up to \$150K USD (includes purchase of Zootrition source code as well as changes) will be obtained from initial sponsorship funding within 2021, with anticipated ongoing operational costs budgeted at \$10K per annum for the first 3 years.

If private sponsorship is unattainable, a secondary plan would be to finance the program updates through prepaid user license fees (\$1000 for 3 years) from zoological institutions that are able to contribute to this concept, with a goal of 100 participating facilities; interested zoos that are unable to budget participation would be offered a reduced-cost 3-year license. Feed manufacturers would be offered the opportunity for private sponsorship, with an extensive sponsorship package offered. If not already primary sponsors, feedstuff suppliers otherwise would be offered the opportunity to have their full product line included in the database(s) on a per product modest annual fee schedule, with fees directed towards maintenance and operational costs (server storage, technical support).

We anticipate all users to contribute feedback and/or data to the program functionality and content, and expect it to enhance global communications regarding feeding and nutrition of zoo species.

The program can be financed through support and donations from organizations, zoos, aquaria and other institutions, institutional organizations, (food) companies, private donations, grants etc.

### **4. Others aspects considering the designing of the program**

- The program should be web based
- User friendly information should be shareable (level of sharing determined by contributor)
- Multi language and multi-platform (operating systems as well as devices)
- Should have an instruction manual and videos and a reachable helpdesk
- Underlying coding should likely be open source so the program is connectable to other programs
- Source code for Zootrition will be initially sold to the Foundation, and the existing program managed under that umbrella until the new program is released.
- Costs associated with establishing the Foundation, including necessary communications and/or travel costs, would be reimbursed from initial financing.
- The Foundation should have an open structure so the sponsors can see how the money is spent.

## **Project follow up**

- Establish a managing Foundation, and create an Advisory Board
- Develop a specified budget and time schedule for this project. Initial Indications for the program range from 100 to 150.000 USD. Because a large part of the program functionality may be adapted from the existing Zootrition program, source code should be purchased by the Foundation from the owner of that program.
- Discuss and make agreements with other nutrition groups in the world.
- Discuss and make agreements with food companies
- Discuss and make agreements with other institutions, organizations and sponsors.
- Detail the setup of the suggested nutrition program.
- Decide which IT company should develop and support the program.
- Roll out the nutrition program and start a support/helpdesk.

## **Suggested timeline**

- January 2021 – December 2021
  - Establish Foundation
  - Set up Advisory board
  - Detail components of various modules to develop and release
  - Request for Proposal
  - Budget the proposed program
  - Secure financial support
- 2022
  - Secure financial support
  - Identify IT-companies who can make the program
  - Contract with developers
  - Design and test the program
- 2023
  - Testing of the program
  - Roll out the program
  - Support and improve the program

## **General notes**

- The initial costs of setting up the program is at most 150k USD, with 10k USD projected annual operating costs, while the savings for the zoo community can be up to 100 million dollars annually. Also the program can be used for education purposes.
- The actual designing of the program will only start after sponsor support is secured.
- Sponsors will regularly be updated and consulted regarding the development of the program
- Sponsor amounts should be paid if the program is in a designing stage by an IT-company.