

ENG newsletter

No. 2 - June 2006

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WELCOME to the EAZA Nutrition Group Newsletter!

In this edition...

NEWS FROM the MEMBERS

- } Congratulations to **Joeke Nijboer**, who earlier this month successfully defended his thesis on '**Fibre intake and faeces quality in leaf-eating monkeys**'. Based at Rotterdam Zoo in The Netherlands, Joeke is well-known for his promotion of our discipline as an essential element of zoo animal husbandry within the zoo nutrition community in Europe and beyond. The series of European Zoo Nutrition Conferences and associated publications are probably the most visible example of his professionalism, but he has provided support and encouragement to many students and colleagues over the years (including several of the editorial board), so it is very fitting and a great pleasure to address him as Dr. Nijboer! Contact Joeke directly (j.nijboer@rotterdamzoo.nl) for more information.
- } It was decided during the **European Association of Zoo & Wildlife Vets (EAZWV)** Board Meeting at Ebeltoft Zoo in May 2005 and enhanced again during the 21st Board Meeting in October 2005, to set up a group of EAZWV-members interested in zoo animal nutrition to act as place for contact for zoo vets with a specific question related to nutrition. The idea is that members of this group may in some cases be able to answer the question themselves or in any case can assist in linking zoo veterinarians to nutritionists. The main challenge is to link zoo veterinarians and nutritionists. The new EAZWV Nutrition Working Group web page is now online and can be found under Working Groups in the menu at www.eazwv.org.
- } The **International Zoo Yearbook** is an international forum for the exchange of information on the role of zoos in the conservation of biodiversity, species and habitats. A new publishing arrangement means these papers are now cited in subscription-based bibliographic search engines and the free-access Google Scholar (scholar.google.com). Articles from **Volume 39: Zoo Animal Nutrition (2005)** have just gone online (www.blackwellpublishing.com/izy); abstracts can viewed for free by clicking on the 'latest issue' link. Volume 40: Elephants and Rhinoceros (just published) will be indexed very shortly.

RECENT REFERENCES

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- } **Childs-Sanford, S.E. and C.R. Angel.** (2006). Taurine deficiency in maned wolves (*Chrysocyon brachyurus*) maintained on two diets manufactured for prevention of cystine urolithiasis. *Zoo Biol* 25:87-100.

This study assesses the long-term effects of an experimental diet vs. a commercially available manufactured diet, intended to reduce clinical disease related to cystinuria, on the taurine status of captive maned wolves. For 13 weeks, two pairs of maned wolves were maintained on the commercially available maintenance diet, whereas two individually housed wolves were maintained on the experimental diet. All six wolves, at the beginning and at the end of the diet trial, had severely decreased plasma concentrations of taurine. Both diets were supplemented subsequently with taurine at a concentration of 0.3%. All study animals were eventually switched to the taurine-supplemented version of the commercially manufactured maintenance diet and subsequent samplings were carried out to monitor plasma taurine concentrations. A final sampling, carried out approximately 5 months after the initiation of taurine supplementation, showed an average taurine concentration within the target canine reference range. Numerous physiologic and dietary factors could be potential contributors to the development of taurine deficiency in the maned wolves in this study, nonetheless taurine supplementation should be considered in maned wolves maintained on diets intended for reduction of cystinuria-related complications.

- } **Schmidt, D.A., D.A. Travis, and J. Jason Williams** (2006). Guidelines for creating a food safety HACCP program in zoos or aquaria. *Zoo Biol* 25:125-136.

The Hazard Analysis and Critical Control Point (HACCP) monitoring system has traditionally been used to increase quality control in human food production operations and there is pressure to implement it at the producer and purchaser levels of the food chain. Recently, the concept of HACCP monitoring has extended to food fed to domestic animals. Captive wildlife facilities, such as zoos and aquaria, would benefit from a well-organized, food safety and nutritional monitoring system. Zoos and aquaria spend significant resources in time and money on maintaining the health of their animals; much of this energy is focused on disease prevention and adequate nutrition. The result of these combined efforts is the implementation of a HACCP program in zoo food management. Although zoo food handling standards have been implemented through the American Zoo and Aquarium Association (AZA) accreditation process, food borne disease outbreaks and malnutrition still exist. By implementing an organized approach to monitoring the quality of food delivered to the animals, the safety and nutritional value of the foods will increase, while decreasing the financial loss due to food waste and time spent caring for ill animals. This report provides a framework for implementing a HACCP program into the food preparation and handling system of zoos and aquaria.

- } **Sommerfeld, R., M. Bauert, E. Hillmann, and M. Stauffacher** (2006). Feeding enrichment by self-operated food boxes for white-fronted lemurs (*Eulemur fulvus albifrons*) in the Masoala exhibit of the Zurich Zoo. *Zoo Biol* 25:145-154.

In the new Masoala exhibit of the Zurich Zoo four self-operated food boxes were installed to encourage arboreal behavior and higher activity levels, and to increase the attractiveness to visitors of a group of three white-fronted lemurs (*Eulemur fulvus albifrons*) and one Alaotran gentle lemur (*Hapalemur griseus alaotrensis*). Data obtained by direct observations with and without food boxes present were compared. In addition, visitors were surveyed to investigate attractiveness of the lemurs. Overall activity and locomotor behavior increased due to food box presentation. Furthermore, the visitor survey documented that the lemurs were spotted more often in trees when the food boxes were present. Because behavior patterns of the subjects approached natural levels with food boxes, the presentation of self-operated food boxes seems a valuable tool to improve the captive environment of lemurs.

- } **Mustonen, A., T. Pyykönen, J. Aho, P. Nieminen** (2006) Hyperthermia and increased physical activity in the fasting American mink *Mustela vison*. *Journal of Experimental Zoology Part A*: 305(6):489-98.

The aim of this study was to investigate the thermoregulatory adaptations to fasting in a medium-sized mustelid with a high metabolic rate and energetic requirements. Sixteen American minks, *Mustela vison*, were divided into a fed control group and an experimental group fasted for 5 days. The deep body temperature (T_b) of the minks was registered with intraabdominal thermosensitive loggers and the locomotor activity was videotaped continuously for 5 days during the fasting procedure. The T_b of the fasted animals increased during the first day of fasting and decreased during the second day. After 3-4 days of fasting, the levels of physical activity and T_b of the fasted minks increased above the levels of the fed animals. Significant increases in these parameters were observed at the beginning of the working day on the farm, during the feeding of the fed animals and around midnight. It is concluded that the mink differs from previously studied homeotherms in thermoregulatory and behavioral responses to fasting probably due to its high energy requirements and predatory success.

- } **Hatt, J.-M et al.** (2005) Energy and fibre intake in a group of captive giraffe (*Giraffa camelopardalis*) offered increasing amounts of browse. *J Vet Med A Physiol Pathol Clin Med.* 52(10):485-90.

The authors investigated the effect of diet on intake of energy and fibre in a group of three captive adult giraffe. Two lucerne hay-only diets of differing quality were fed, as well as the regular diet of lucerne hay and concentrates, and the regular diet supplemented with 3 or 6 kg of edible, fresh browse material. Results confirm that giraffes are unlikely to meet energy requirements on lucerne hay-only diets. In a feeding scenario where both lucerne hay and the concentrate component of the diet are fed ad libitum, the animals tended to exchange hay for browse when browse was added. Only the higher level of browse supplementation led to a potentially beneficial increase in fibre intake. Whether additional browse supplementation will lead to increased intakes in a feeding scenario with restricted concentrate provision can be suspected but remains to be demonstrated.

ENG FAVOURITES

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- } www.nagonline.net/husbandry_manual_chapters.htm - a list of AZA groups that have provided information to the **Nutrition Advisory Group** about their husbandry manuals.
- } www.nal.usda.gov/fnic/foodcomp/search - search the **USDA National Nutrient Database** online. From this page is a link to also view reports on foods by individual nutrients, e.g. calcium.
[Note from the Editor: Are there other national food databases available? Particularly ones in other languages? Please send details for publication in future editions!]
- } www.nap.edu/catalog/nrs/ - **nutrient requirement standards** for economically important domestic animals and laboratory animals have served as the foundation for animal feed formulas in the United States and abroad since the first **National Research Council (NRC)** report was published in 1921. Follow the link for details of a set of nutrient requirement books, or read each online for free, a page at a time.

ANNOUNCEMENTS

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- } **6th NAG Conference on Zoo and Wildlife Nutrition** was hosted by Omaha's Henry Doorly Zoo, Nebraska from October 16th-19th 2005, in parallel to the AAZV conference. The comprehensive programme started with two half-day workshops on nutritional "hot-spots", namely "Assessment of mammalian body condition: theory and application" by Mark Edwards and "Reducing the guesswork: Forage testing and evaluation" by Bruce Anderson. During the following 3 days, 45 talks and 7 scientific posters on nutritional topics were presented. While there were contributions on all aspects of zoo and wildlife nutrition, a special focus was on herbivore nutrition, with contributions on different aspects of giraffe nutrition and aspects of feeding browse. Those interested in hard copies or CD's of the proceedings, please check www.nagonline.net for further information.
- } **5th Comparative Nutrition Society Symposium** will be held from August 4-9 2006 at the Keystone Resort & Conference Center in Keystone Colorado. The programme will cover many areas of animal nutrition and also features a special session on: Extreme Nutrition - nutritional and metabolic adaptations needed to thrive on the extremes of food types and environments. See www.cnsweb.org for more details.
- } **23rd Annual Conference of EAZA** is being hosted by Zoo Aquarium Madrid, from 3-7 October 2006. Our next business meeting will take place during this conference and there is room for posters or to give a short presentation during the meeting. Such presentations may deal with any topic that is of relevance to (parts of) the EAZA zoo community, making it ideal forum for discussing nutritional issues with a wider audience. If you are interested in presenting material please forward a short description to Andrea Fidgett in the first instance (a.fidgett@chesterzoo.org). Full details of the conference and a draft version of the programme are available online at www.eaza.net.

Membership of the EAZA Nutrition Group

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The **EAZA Nutrition Group** and its members aim to provide nutrition advice to zoo-based conservation breeding programmes, by developing guidelines and protocols for general use. Membership is open to ALL individuals who support the aims of the EAZA Nutrition Group or want to know how they can improve nutrition in their zoo and is not limited to Europeans. If you're reading this newsletter and want to know more about zoo animal nutrition, it means YOU!

Joining the group is simple. Use the email link at the top of this newsletter [a.fidgett@chesterzoo.org], putting 'Join ENG' in the subject line. You will be sent a form to complete asking for your contact details and also to indicate your interests and/or expertise to create a very useful membership directory.

Your newsletter needs YOU!

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The purpose of the **EAZA Nutrition Group Newsletter** is to provide a regular means of circulating current information on zoo animal nutrition. A wide range of material will be considered for publication including announcements, notes, useful links, recent

references, news & reviews.

The aim is to provide a process with a fast turn around to maintain communication in-between conferences and other meetings. And it's not just dedicated nutritionists who are likely to want or need to know this information (just as well, or we'd be a very small group!). An electronic newsletter keeps everyone up-to-date and will be available in PDF format for printing and displaying in your zoo or department.

Your newsletter needs you! We plan to bring this newsletter to you every 2 months and will rely on your feedback about the content - both how useful it is and also to send us ideas about what you want included.

And finally...

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- } **Duodenum** - the first portion of the small intestine, so called because its length is approximately twelve-finger breadth. From Medieval Latin, short for intestinum duodenum digitorum (intestine of twelve fingers), from Latin duodeni (twelve each) and duodecim (twelve).

Editorial Board

Cora Berndt (Emmen Zoo); Andrea Fidgett (Chester Zoo); David Gomis (Zoo Mulhouse); Jürgen Hummel (University of Bonn/Cologne Zoo); Kristina Johansen (Ebeltoft Zoo); Annette Liesegang (University of Zurich); Helena Marquès (conZOOlting); Christoph Schwitzer (Cologne Zoo).

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