THE GOOD, THE BAD, AND THE UGLY: FEEDSTUFF EVALUATION AND QUALITY CONTROL

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Overall diet quality is controlled by the quality of the individual items that comprise the diet. This seems intuitively obvious, but is "easier said than done" when it is applied to zoo diets. Usually we use multiple items in combination (complete feeds, produce, meat, fish, whole prey, etc.) to meet the nutrient needs of the animals in our care, and each of these items has special considerations when it comes to quality control and evaluation. Whereas visual, tactile, and olfactory appraisal is a good place to start, there is much that such an evaluation misses. Evaluation of items prior to inclusion in zoo diets is one in a series of critical control points in the process of providing the best possible diets to our animals. This workshop, presented as a part of AAZV's program (summarized as part of the NAG Conference), addresses issues involved in the quality control and evaluation of feeds commonly used in zoos (complete feeds, produce, meat, fish, whole prey, etc.) through: 1) examination of the rules, regulations, and suggestions provided by those with expertise in the area; 2) discussions of each food type and the concerns associated with each; and 3) practical evaluation of example food items.

In many cases, there are outstanding reference materials available for developing quality evaluation programs and techniques for zoos. Some of these references include:

Beauchat, L.R. and J.H. Ryu. 1997. Produce Handling and Processing Practices. Emerg Infect Dis 3(4): 459-465.

Bernard, J.B. and M.E. Allen. 1997. Feeding Captive Piscivorous Animals: Nutritional Aspects of Fish as Food. AZA Nutrition Advisory Group Fact Sheet 005. (available on www.nagonline.net; Technical Papers Section).

Bernard, J.B. and J.L. Dempsey. 1999. Quality Control of Feedstuffs: Nutrient Analysis. AZA Nutrition Advisory Group Fact Sheet 010. (available on www.nagonline.net; Technical Papers Section).

Crissey, S.D. 1998. Handling Fish Fed to Fish-Eating Animals: A Manual of Standard perating Procedures. U.S. Department of Agriculture, Agricultural Research Service, National Agricultural Library.

Crissey, S.D., K.A. Slifka, P. Shumway, and S.B. Spencer. 2001. Handling Frozen/Thawed Meat and Prey Items Fed to Captive Exotic Animals: A Manual of Standard Operating Procedures. U.S. Department of Agriculture, Agricultural Research Service, National Agricultural Library.

Dierenfeld, E.S., J.G. Doherty, and K. Dolan. Unpublished. Nutrient Composition of Selected Temperate Browses Fed in Zoos. Wildlife Conservation Society, Bronx, NY, USA.

Lintzenich, B.A. and A.M. Ward. 1997. Hay and Pellet Ratios: Considerations in Feeding Ungulates. AZA Nutrition Advisory Group Fact Sheet 006. (available on www.nagonline.net; Technical Papers Section).

Mahovic, M., J. Brecht, S. Sargent, M. Ritenour, K. Schneider, A. Simonne, and J. Bartz. 2002. Fresh Produce Handling, Sanitation, and Safety Measures: Citrus. University of Florida Cooperative Extension Service Fact Sheet FSHNO221. Institute of Food and Agricultural Sciences, University of Florida, Gainesville.

Motrimore, S. and C. Wallace. 1994. HACCP: A Practical Approach. Chapman and Hall Pub, New York, NY.

Holland, C. and W. Kezar, Eds. 1995. Forage Nutrition and Non-Fermented Forages *In* <u>The Pioneer Forage Manual – A Nutritional Guide</u>. Pioneer Hi-Bred International, Inc., Des Moines, Iowa.

Richter, E. and I. Al-Sheddy. 1990. Microbial Quality and Safety of Zoo Food. App Env Microbiol. 56: 877-880.

Schmidt, R.H. 1997. Basic Elements of a Sanitation Program for Food Processing and Food Handling. University of Florida Cooperative Extension Service Fact Sheet FS 15. Institute of Food and Agricultural Sciences, University of Florida, Gainesville.

Ullrey, D.E. 1997. Hay Quality Evaluation. AZA Nutrition Advisory Group Fact Sheet 001. (available on www.nagonline.net; Technical Papers Section)