

Posters from Section III

Assay of menus as part of multicenter clinical feeding trials. K. Stewart,^{a*} K. Phillips^a & C. Champagne^b (for the DELTA and DASH Investigators).

^a*Department of Biochemistry & Anaerobic Microbiology, VPI&SU, Blacksburg, VA 24061-0308, USA.* ^b*Pennington Biomedical Research Center, Baton Rouge, LA 70808, USA.*

In experimental feeding trials, chemical measurement of the key nutrients in prepared diets is essential to definitively link endpoint measurements to different dietary treatments. Some investigators have believed that long-term, multicenter diet studies would be difficult due to variance of key nutrient concentrations across centers and across time. The NHLBI-sponsored DELTA and DASH studies are conducting multicenter, long-term feeding trials. Therefore, it was necessary to document that the diets fed at different centers were 'virtually identical' throughout the diet interventions spanning 8 months or longer. DELTA used central procurement of fat sources, local procurement of the other foods and local preparation of the diets using standardized recipes. DASH used local procurement of the foods and local preparation of the diets using standardized recipes. Both studies used foods donated by various commercial companies. The DELTA group did a pilot study in which 3 menus were prepared 3 separate times at each of 4 centers. The diets were shipped to our laboratory, then composited individually and assayed for the key nutrients in the study. The key nutrient levels were consistent across centers and across time demonstrating the feasibility of conducting a multicenter study using local diet preparation. Both DELTA and DASH did prefeeding menu validation. To ensure that enough menus met target nutrient levels for each diet, 150% of the needed menus were designed and calculated to meet target nutrient specifications using food composition tables. Menus for each diet were prepared at each of two centers, shipped to our laboratory, composited individually, and assayed for the key nutrients (DELTA: total fat, saturated fat, monounsaturated fat, polyunsaturated fat, and cholesterol; DASH: sodium, potassium, magnesium, calcium and total fat). In DELTA 75% of the menus met design nutrient specifications for all 3 diets and were used for the dietary intervention; in DASH 60% of the menus met the design specifications; the remaining menus were omitted from the studies. Both DELTA and DASH also monitored diet composition during the feeding intervention. All diets were sampled for full diet cycles, at specified intervals at the 4 centers throughout the feeding trial and assayed as diet cycle composites. To date, the assayed contents of diet cycle composites have been

reproducible and shown the designed clear separation of the experimental variables across centers throughout the long (months) experimental feeding periods. Rigid assay control, including the use of fixed assay procedures and quality control standards was essential to obtain analytical data with acceptable precision and without assay drift. These studies demonstrate that well-defined identical diets can be fed at multiple sites over periods of months, providing adequate design, validation, monitoring, and assay protocols are followed. Supported by grants no. 5-U01-HL-49644-03 and 1-U01-HL50982-01 from NHLBI.

*To whom correspondence should be addressed.

Nutrient losses and gains in the preparation of foods: NLG project. Lena Bergström.

National Food Administration, Box 622, S-751 26 Uppsala, Sweden.

The Eurofoods Nutrient Losses and Gains Project (NLG) was established in 1983. The aim of the project was to collect data related to nutrient losses and gains in the preparation of foods with a view to recommend factors for use with the calculation of nutrient content of foods and recipes.

The suggested NLG standard factors at the recipe level were based on mean values (some values are modified) of factors published by different government agencies. Factors were applied to 11 vitamins (retinol, β -carotene, vitamin C, thiamin, riboflavin, niacin, B₆, folacin, B₁₂, pantothenic acid, biotin). Separate factors were determined for preparation without heat and the cooking methods of boiling, shallow frying and baking or roasting. These were used for all food groups, except meat and poultry, for which alternative factors were derived.

The NLG factors were used in a study in which the analysed and calculated nutrient content of six Swedish dishes was compared. The nutrient data base was PC-Kost, version 1991. The values are produced as follows: Dishes, analysed by the laboratories of the National Food Administration; Recipes, calculated on raw ingredients with factors for weight yield and vitamin retention. Computer system: AIVO AB; Recipes, calculated on raw ingredients with weight yield factors. Computer system: Rudans Lättdata; Recipes, calculated on raw ingredients. Computer system: Rudans Lättdata.

The results of the comparison show that some calculated values agree rather well with the analytical data, while others do not, e.g. in boiled beef, where some nutrients should be found in the bouillon. The differences may partly be due to different nutrient contents in the analysed ingredients than in the ingredients included in the data base.