USDA-INDUSTRY COLLABORATION IN THE GENERATION OF FOOD COMPOSITION DATA

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Recent interest in consumption of low-fat, low-cholesterol foods has prompted collaboration of the United States Department of Agriculture (USDA) and the food industry to provide current information regarding the composition of food being consumed in this decade. Accurate food composition data is required by many groups in industry and government. Food manufacturers are interested in providing up-to-date accurate composition data on the label and government agencies are interested in providing up-to-date information for food intake surveys and other research.

Industry-Government collaboration on technical problems can be beneficial for both groups. This is especially true in the area of research data generation, and specifically of nutrient composition data. Government and industry both need this information and some of our shared projects have provided cost savings for both groups. I will discuss two recently completed projects which have generated valuable data for both groups.

Scientists at the Nutrient Composition Laboratory are concerned with developing analytical methodology, and more recently are concerned with maintaining accuracy of food composition data. Agriculture Research Service has commodity specialists in laboratories at Beltsville, Maryland and in a number of agricultural research centers in other parts of the U.S. Universities are also frequently working with analytical projects and share their expertise and data to the combined effort of maintaining accurate food composition data.

USDA is also a user of nutrient data through the Human Nutrition Information Service and the Nutrition Monitoring System so there is expertise in determining what data is needed. Other government agencies also use nutrient data, such as the Agriculture Marketing Service and Food Safety and Inspection Service of USDA, and the National Center for Health Statistics.

Industry likewise provide considerable data on food composition that are incorporated into food composition handbooks published by USDA. Industries are concerned about the nutrient content of foods they produce. Industry conducts considerable analytical work on their products to comply with labeling requirements of the FDA. Industry expertise in the marketing area is especially valuable to USDA in the development of representative nutrient values. Industry has an unique insight on the future of food products, and many have provided confidential forecasts that improve USDA's food sampling plans. In addition to information, industry groups often provide manpower, food samples, and dollars for product analysis.

Some of the most valuable cooperative ventures involve development of new analytical methodologies. Industries often develop simplified methods for analysis. By sharing samples and results we can evaluate these new methods and benefit from those that are valid.

Two recent collaborative efforts illustrate the mutual benefits of these endeavors. The first began when the National Cattleman's Association and the National Livestock and Meat Board came to USDA's Human Nutrition Information Service (HNIS) and asked that USDA's meat values be reviewed. These two commodity groups claimed that meat marketing practices had undergone radical changes that were not reflected in the most current USDA publications. To address this need a study was designed with the cooperation of both commodity groups and USDA's Meat Science Research Laboratory and Nutrient Composition Laboratory at Beltsville as well as the Nutrient Data Research Branch of HNIS. The National Center for Health Statistics were also involved because of the upcoming Health and Nutrition Examination Study (HANES) study. The Agricultural Research Service and the National Cattleman's Association checkoff program both contributed funds and the study was conducted at Texas A & M University.

In this study a sampling plan was devised that selected retail beef from supermarket chains that provided at least 1/3 of the beef in a given city. In most cities two supermarket chains met the criteria of sampling. Samples were selected in sixteen cities in an attempt to assess variability and track geographical trends of meat merchandizing.

In the actual collection of samples at the representative grocery stores, two samples of each cut were purchased for chemical dissection and chemical analysis. A large ground beef sample was also taken. Thickness of both cover fat and seam fat was measured. Results of the analysis will be discussed by Lynn Dickey later in this conference.

A second recent study involved analysis of eggs. Analytical data on cholesterol in eggs was published in Handbook No. 8-1 in 1976. This was based on the calorimetric methods published at that time. Two large egg manufacturers began marketing eggs with cholesterol values of about 2/3 that published in the USDA handbook. Their carton reported 190 or so mg cholesterol, while the USDA value was 274 mg cholesterol. The Egg Nutrition Center asked that USDA reconsider their egg values and agreed to participate in a collaborative study to rectify the discrepancy. A joint endeavor between the Egg Nutrition Center and three USDA services (HNIS, the Agriculture Marketing Service, and the Nutrient Composition Laboratory) conducted a comprehensive study of the nutrient composition of eggs.

The egg study was conducted in two seasons, summer and winter, because of a suggestion in the literature of a seasonal effect. Sampling occurred in Summer of 1988 and Winter 1989. The Egg Nutrition Center provided marketing information and helped identify 200 major egg packers across the United States and asked them to become part of this project. In the first phase 118 packers contributed eggs to the study which was representative of 67% of the US egg production.

The contractor who conducted the analysis made 26 yolk composites that were analyzed for cholesterol, fat, and fatty acids. In addition 13 composites of whole eggs were analyzed for proximates, vitamins, and minerals. Because there was only a small variation between the 26 composites, only 7 yolk and 7 whole egg composites were made during the Winter phase.

Selecting the appropriate contractor to conduct the analysis was an important aspect of this study. We were fortunate to have a standard reference material for cholesterol from the National Institute for Standards and Technology (NIST) with a certified cholesterol value. We sent this material to several commercial analytical laboratories for analysis. Based on these results, a laboratory was selected using the criteria of analytical accuracy, analytical precision, and cost - with accuracy and precision weighted most heavily. In addition, the laboratory analyzed a sample of a quality control material with each batch of eggs that was analyzed. Evaluation of these results indicated that the contractor performed well throughout the project which increased our confidence in the data that were generated. Ms. Lynn Dickey will discuss the results of this study later in this conference.

These two projects illustrate the mutual benefit of collaborative efforts. Of equal importance is the opportunity for technology transfer between government and industry. Government needs the expertise of industry scientists, and industry can benefit from the expertise of government scientists. Each of us learn something as we engage in cooperative ventures, and we come to understand and appreciate the unique problems faced by each group.