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FOOD COMPOSITION HARMONISATION

IN INTERNATIONAL NUTRITION

PROGRAMME MANAGEMENT

A thesis presented in partial fulfilment of the requirements for the degree
Doctor of Philosophy in Management
Massey University

Barbara A. Burlingame
1997
ABSTRACT

Food Composition Harmonisation in International Nutrition Programme Management

Food composition data underpin some of the most fundamental activities in nutrition. Yet these data are being generated, compiled, disseminated and used without a consistent approach, cohesive framework or proper management guidelines. The International Network of Food Data Systems (INFOODS) was established to address these problems.

The aim of this thesis was to examine the concept of the international food composition programme management framework, and extend that concept specifically as it relates to harmonisation issues, into the next stages of elaboration. The research focus was to identify the issues, analyse the problems, and propose solutions.

The management challenges identified and analysed included technical harmonisation issues, inter-sectoral coordination of activities, infrastructural capacity-building, and establishing broad inter- and intra-agency affiliations.

The two technical harmonisation issues most critical to achieving success were identification of foods, including development of standards and guidelines for food nomenclature, terminology, descriptions, images, and associated documentation; and identification of food components, including all the methodological and documentation considerations. The development of these standards required coordination at the international level, and implementation regionally and nationally.

The significant sectors involved in food composition activities included health, agriculture and trade. Each had its own dominant area but the overlaps were significant, and in many cases, coordination of the sectors was not achieved, even at the national level. This led to inefficient use of resources and the production of data that was not suitable for all required purposes. Pursuing greater coordination between sectors led to better allocation of funds for all the activities, and ultimately addressed some of the significant infrastructural problems which were largely related to resource restriction. Trade was shown to be the sector presenting the most demanding of the harmonisation requirements.

Affiliation required liaison and agreements with international agencies involved in different — or the same — aspects of food composition work. For food composition harmonisation issues, the Codex Alimentarius Commission, the World Trade Organization, and AOAC International were identified as being most relevant for INFOODS to pursue on behalf of the food composition community. Many other aspects of affiliation were identified at the regional and national levels.

The INFOODS concept was endorsed as the appropriate framework; with national food composition programmes contributing to and cooperating with regional data centres, which facilitated a coordinated approach to food composition activities for a group of countries; and with a global secretariat undertaking the work of international coordination. Although the concept was endorsed, the framework and the activities required more development.
ACKNOWLEDGMENTS

I would like to acknowledge the New Zealand Institute for Crop & Food Research and its Chief Executive Officer Dr Mike Dunbier, for allowing me to undertake my doctorate studies as part of my nutrition programme research work; and Drs Nevin Scrimshaw, John Klensin and Abraham Besrat of the International Nutrition Foundation for Developing Countries and United Nations University, for entrusting me with the management of the INFOODS project since 1994.

I would also like to thank the INFOODS Regional Data Centre Coordinators from 18 regions and subregions, and the many people working in national food composition programmes around the world, for participating in focus groups sessions and responding to questionnaires.

Acknowledgment and thanks is due to the members of New Zealand’s national Food Composition Steering Committee who, over the ten years of my involvement as the programme leader for New Zealand’s food composition programme, have provided advice and guidance for the programme’s effective operation; to Professor Mary Earle, who has been an inspiration and role model for me and many women in science in New Zealand, for her encouragement both in her capacity as professor of food technology and as a director for Crop & Food Research; and to Dr Fred Potter, biometrician with Crop & Food Research, for some of the statistical analyses and interpretation.

Thanks is due, too, to my husband, Dr Christopher Epp who has gone through this process himself and was therefore sympathetic and understanding; and to my children, Justus and Adam, who as active teenagers with busy lives, barely noticed my presence or absence at home, thus freeing me from most feelings of maternal guilt.

And finally, I would like to thank my supervisors, Dr Mervyn Probine, New Zealand’s preeminent scientist cum manager and Senior Fellow in the Department of Management Systems, and Dr Tony Vitalis, engineer and Professor of Management Systems, for their vast experience and knowledge in science management which they imparted so generously and effectively, and for their wisdom and inspiration in guiding me in designing my research approach and in the preparation of this thesis.
When contemplating pursuing a PhD, I was faced with the dilemma of seeking further qualifications in the scientific discipline in which I was already academically trained and practising (nutrition science), or developing new and formal skills in a field in which I was working (science management) but for which I had no academic training. I chose the latter. In order to ready myself to pursue this doctorate degree in the Department of Management, I undertook course work in Massey’s business faculty, taking one postgraduate level paper a year for six years since 1988. The first five papers were in marketing, organisational behaviour, accountancy, public policy and food law, and for these I earned a postgraduate diploma in business and administration. The next year I took an additional postgraduate paper in organisations and management, and upon completion, I began preparing this thesis in earnest.

Being more familiar with experimental research as a nutrition scientist, I found the research methodologies in management unfamiliar. I decided to use several techniques in my research approach: interviews, focus groups, case studies, surveys, and analysis of many official, governmental, and legal documents.

The approach of this thesis is to examine the concept of the international food composition programme management framework, and extend that concept specifically as it relates to harmonisation issues, into the next stages of elaboration. The research focus is to identify the issues, analyse the problems, and propose solutions.

Chapter 1, *Issues and context*, provides the basis of the thesis by identifying the pervasive and most commonly perceived difficulties in managing food composition programmes, and then classifying the activities and sectors to establish the framework for engaging and improving harmonisation.

Chapter 2, *Managing New Zealand’s food composition programme*, addresses inter-agency disharmony with data generators and legislators, regional disharmony with our food composition partners in the region, and international disharmony with other nations, and non-government regulatory and policy agencies. Parts of this chapter were used in the presentation of invited papers at the 3rd Asia Pacific Food Analysis Network Conference in Manila in 1995 and New Zealand’s annual Institute of Food Science and Technology Conference in Lincoln in 1996.
Chapter 3, *Harmonisation issues in identification of food*, involves analysis of the information management strategies currently in use, the problems encountered by various sectors of information users, and recommendations for practical and immediate means of dealing with the problems of food identification. The issues are food nomenclature and terminology systems, and imaging systems to complement these. Parts of this chapter were presented as an invited papers at the First International Food Data Conference, held in Sydney in 1993, and subsequently peer-reviewed and published by AOAC International; at the National Nutrient Databank Conference in St Louis in 1994; and, integrated with part of Chapter 5, at the 16th International Congress of Nutrition in 1997.

Chapter 4, *Harmonisation issues in identification of food components*, involves a critical assessment of the systems currently in use, qualification and quantification of the problems created by lack of harmonisation using carbohydrates as the model food component, and recommendations for implementation of procedures for adopting the INFOODS standard. Much of this chapter was published in mid-1996 as original research in the international refereed Journal of Food Composition and Analysis.

Chapter 5, *Harmonisation for food legislation and food trade regulations*, examines international and other multi-lateral and bilateral trade agreements with implications for food composition information, identifying areas of disharmony and incompatibility, and assessing the impact of the disharmony where it remains unaddressed. Part of this chapter, integrated with part of chapter 3, was presented at the 16th International Congress of Nutrition, and at a EUROFOODS technical workshop, both in 1997.

Chapter 6, *Tying it all together*, consolidates the issues and the problems and brings them into a management framework for an overall pragmatic solution.

This thesis is based on research I have undertaken in several capacities: the global INFOODS Coordinator (1994-present); regional data centre coordinator for OCEANIAFOODS, the INFOODS Regional Data Centre which includes New Zealand (1989-1992), as well as an OCEANIAFOODS member (1987-present); and national food composition programme leader for New Zealand (1987-present).
ACRONYMS AND ABBREVIATIONS

AACC  American Association for Clinical Chemistry
ANSI  The American National Standards Institute
ANZFA  Australia New Zealand Food Authority
AOAC  formerly, Association of Official Analytical Chemists
AOCS  American Oil Chemists’ Society
AREv  Advanced Revelation
ASEAN  Association of South East Asian Nations
ASEANFOODS  INFOODS Regional Data Centre for ASEAN Countries
Austr  Australia
CAB  Commonwealth Agricultural Bureau
CAId  Component Aspect Identifier
CARKFOODS  INFOODS Regional Data Centre for Central Asian Republics and Kazakhstan
CCITT  Consultative Committee on International Telegraph & Telephone
CCMAS  Codex Committee on Methods of Analysis and Sampling
CD  Compact Disk
CD-ROM  Compact Disk-Read Only Memory
CEECFOODS  INFOODS Regional Data Centre for Central and Eastern Europe
CER  Closer Economic Relations
CFR  Code of the Federal Regulations (USA)
cmt  Comment
COST  Cooperation in Science and Technology (Europe)
CRI  Crown Research Institute (New Zealand)
DCT  Discrete Cosine Transform
DF  Degrees of Freedom
DMSO  Dimethylsulfoxide
dpi  Dots per inch
DSIR  Department of Scientific and Industrial Research (NZ)
DV  Daily Reference Values (USA)
EC  European Community
EDTA  Ethylenediaminetetraacetate
ep  Edible portion
ESR  Institute of Environmental Science & Research (NZ)
EU  European Union
EUROFOODS  INFOODS Regional Data Centre for Western Europe
EuroNIMS  Proprietary name for the food composition data management software developed in the EUROFOODS Region
The Food and Agriculture Organization of the United Nations
Food Balance Sheets
Food and Drug Administration (USA)
Foundation for Research, Science and Technology (NZ)
Grams
General Agreement on Tariffs and Trade
Gas chromatography
Global Environmental Monitoring System
Graphics Interchange Format
Gas liquid chromatography
INFOODS Regional Data Centre for the Arab Gulf States
Hazard Analysis Critical Control Point
Health, Education and Welfare
High performance liquid chromatography
Hypertext Markup Language
Institute of Nutrition for Central America and Panama
The International Network of Food Data Systems
INFOODS Nomenclature and Terminology
Intellectual property
International Standards Organization
International Units
International Union of Nutritional Sciences
International Union of Pure and Applied Chemistry
Journal of the Association of Official Analytical Chemists
Joint Photographic Experts Group
Kilo bytes
Kilocalories
Kilograms
Kilojoul es
Kruskal-Wallis One Way Analysis of Variance
INFOODS Regional Data Centre for Central and South America
Life in New Zealand
Ministry of Agriculture and Fisheries (NZ)
Ministry of Agriculture, Fisheries and Food (UK)
INFOODS Regional Data Centre for Middle Asia
Megabytes
Microgram (also μg)
Monosaccharide equivalents
INFOODS Regional Data Centre for the Middle East
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