FOOD COMPOSITION HARMONISATION

IN INTERNATIONAL NUTRITION

PROGRAMME MANAGEMENT

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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.

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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.

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PREFACE

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 Kazakstan
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

FAO	The Food and Agriculture Organization of the United Nations
FBS	Food Balance Sheets
FDA	Food and Drug Administration (USA)
FRST	Foundation for Research, Science and Technology (NZ)
g	Grams
GATT	General Agreement on Tariffs and Trade
GC	Gas chromatography
GEMS	Global Environmental Monitoring System
GIF	Graphics Interchange Format
GLC	Gas liquid chromatography
GULFOODS	INFOODS Regional Data Centre for the Arab Gulf States
HACCP	Hazard Analysis Critical Control Point
HEW	Health, Education and Welfare
HPLC	High performance liquid chromatography
HTML	Hypertext Markup Language
INCAP	Institute of Nutrition for Central America and Panama
INFOODS	The International Network of Food Data Systems
INT	INFOODS Nomenclature and Terminology
IP	Intellectual property
ISO	International Standards Organization
IU	International Units
IUNS	International Union of Nutritional Sciences
IUPAC	International Union of Pure and Applied Chemistry
JAOAC	Journal of the Association of Official Analytical Chemists
JPEG	Joint Photographic Experts Group
KB	Kilobytes
kcal	Kilocalories
kg	Kilograms
kJ	Kilojoules
K-W	Kruskal-Wallis One Way Analysis of Variance
LATINFOODS	INFOODS Regional Data Centre for Central and South America
LINZ	Life in New Zealand
MAF	Ministry of Agriculture and Fisheries (NZ)
MAFF	Ministry of Agriculture, Fisheries and Food (UK)
MASIAFOODS	INFOODS Regional Data Centre for Middle Asia
MB	Megabytes
mcg	Microgram (also µg)
ME	Monosaccharide equivalents
MEFOODS	INFOODS Regional Data Centre for the Middle East

MFAT	Ministry of Foreign Affairs and Trade (NZ)
mg	milligrams
MoH	Ministry of Health (NZ)
N	Nitrogen
NAFTA	North American Free Trade Agreement
NFA	National Food Authority (Australia)
NGO	Non-government organisation
NLEA	Nutrition Labeling and Education Act (USA)
NORAMFOODS	INFOODS Regional Data Centre for North America
NSP	Non-starch polysaccharides
NZ	New Zealand
NZICFR	New Zealand Institute for Crop & Food Research Ltd
OCEANIAFOODS	INFOODS Regional Data Centre for Australia, New Zealand and 22 Pacific Island countries
P	Probability
PCX	IBM PC Paintbrush Picture File
PGSF	Public Good Science Fund
PKZIP	Compression format by PKWare
RDI	Recommended Dietary Intakes
RE	Retinol equivalents
S	Friedman Statistic
SAARC	South Asian Association for Regional Cooperation
SAARCFOODS	INFOODS Regional Data Centre for SAARC Countries
SCI	Statement of Corporate Intent
SGML	Standard Generalized Markup Language
SPS	Sanitary and Phytosanitary
SRA	Social Responsibility Accounting
SVGA	Super Video Graphics Adaptor
TAS	Technical Assessment Systems Inc.
TBT	Technical Barriers to Trade
TFA	Total fatty acids
TIFF	Tag Image File Format
UNU	United Nations University
USDA	United States Department of Agriculture
VGA	Video Graphics Adapter
WCO	World Customs Organization
WHO	The World Health Organization
WTO	The World Trade Organization

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