

**THE NEED FOR AN ONLINE COLLECTION OF
TRADITIONAL AFRICAN FOOD HABITS**

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ABSTRACT

Amongst the difficulties facing the indigenous people of Africa today is the deleterious shift from traditional food habits to the processed and packaged food products of western-owned corporations. This *nutrition transition* has been implicated in the rise of non-communicable diseases (NCDs) throughout Africa. The purpose of the present investigation was to determine whether there is a current need to document traditional African food habits via an online collection in an attempt to stimulate further research in this area and potentially improve the health status of indigenous Africans threatened by the *nutrition transition*. A systematic search was performed to assess possible gaps in online collections focused on traditional African food habits. A questionnaire was administered to opinion leaders in the nutritional sciences at the 18th International Congress of Nutrition (ICN) in Durban, South Africa, September 2005, to determine the level of awareness of the importance of traditional African food habits within the context of the *nutrition transition*, and to determine the support among this cohort for an online collection of traditional African food habits. Our systematic review resulted in nine collections being identified. None of these collections were specifically designed to raise awareness of traditional African food habits however. Findings from the survey revealed that 86% of our cohort agreed that Africa is currently undergoing a *nutrition transition*. Nearly 80% believed that knowledge of traditional African food habits is being lost. Indigenous African interviewees noted reduced consumption of sorghum and millet and an increased consumption of wheat and rice within their region of origin. Approximately 82% believed that there was currently a gap in online collections focused on presenting information on traditional African food habits. Ninety-two percent of the cohort indicated their preparedness to make use of a novel, online collection of data on traditional African food habits. The findings revealed a critical need to collate and present data on traditional African food habits via a novel, online collection that could be used to stimulate education and research of food habits and their health implications, to provide a well-rounded forum in which such information is presented and shared.

Key words: Africa, traditional foods, wild species, dietary practices, information networks and database.

LA NÉCESSITÉ D'UNE COLLECTION EN LIGNE DES HABITUDES ALIMENTAIRES TRADITIONNELLES AFRICAINES

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Résumé

L'une des difficultés auxquelles font face les populations indigènes d'Afrique aujourd'hui est le passage délétère d'habitudes alimentaires traditionnelles aux produits alimentaires traités et emballés dans des entreprises occidentales. Cette *transition de nutrition* a été identifiée dans la prévalence de maladies non communicables sur tout le continent africain. Le but de la présente enquête était de déterminer s'il est important actuellement de faire connaître les habitudes alimentaires traditionnelles africaines par une collection en ligne en vue de stimuler davantage de recherche dans ce domaine et améliorer éventuellement l'état de santé des populations indigènes africaines menacées par la *transition de nutrition*. Une recherche systématique a été menée dans le but d'évaluer des écarts possibles dans des collections en ligne axées sur des habitudes alimentaires traditionnelles africaines. Un questionnaire a été administré aux leaders d'opinion en sciences alimentaires lors du 18^{ème} Congrès International de Nutrition tenu à Durban en Afrique du Sud en septembre 2005, en vue de déterminer le niveau de sensibilisation à l'égard de l'importance des habitudes alimentaires traditionnelles africaines dans le cadre de la *transition de nutrition*, et de déterminer dans quelle mesure la cohorte interrogée soutient l'idée d'une collection en ligne des habitudes alimentaires traditionnelles africaines. Notre évaluation systématique a abouti à l'identification de neuf collections. Néanmoins, aucune de ces collections n'a été spécifiquement conçue pour faire connaître des habitudes alimentaires traditionnelles africaines. Les résultats du sondage ont révélé que 86% de notre cohorte reconnaissent que l'Afrique subit actuellement une *transition de nutrition*. Près de 80% de ces gens pensent que les connaissances des habitudes alimentaires traditionnelles africaines sont en voie de déperdition. Les indigènes africains interviewés ont fait remarquer une réduction dans la consommation du sorgho et du millet et une augmentation dans la consommation du blé et du riz dans leur région d'origine. Environ 82% pensent qu'il y existe actuellement un écart dans des collections en ligne axées sur la présentation d'informations relatives aux habitudes alimentaires traditionnelles africaines. Quarante-deux pourcent de la cohorte ont exprimé leur détermination à faire usage d'une collection originale en ligne de données portant sur des habitudes alimentaires traditionnelles africaines. Les résultats ont révélé qu'il faut absolument recueillir et présenter des données relatives aux habitudes alimentaires traditionnelles africaines par une collection originale en ligne qui pourrait être utilisée pour stimuler l'enseignement et la recherche en matière d'habitudes alimentaires et des implications de ces dernières sur la santé, afin de fournir un forum harmonieux dans lequel de telles informations sont présentées et échangées.

Mots-clés: Afrique, aliments traditionnels, espèces sauvages, pratiques diététiques, réseaux d'informations et base de données.

INTRODUCTION

The Global Burden of Disease study [1] noted that deaths due to non-communicable diseases (NCDs) have increased dramatically in sub-Saharan Africa, and will account for nearly 45% of deaths in the region by 2020. Recent statistics from the World Health Organization revealed nearly 80% of deaths attributable to NCDs worldwide occur in developing countries [2]. This statistic is notable in light of the obesity-diabetes epidemic reportedly plaguing developed countries.

Numerous empirical and investigative reports have indicated that current NCDs trends in Africa can in many ways be attributed to rapid socio-economic shifts created by an increasingly accelerated agenda for global hegemony fueled by western corporate and political interests [3-5]. This agenda, typically identified as *globalization* or *westernization*, has been implicated in rapid urbanization rates, decimation of the environment, and virtual obliteration of the traditional culture of Africa, [6-8] a continent considered by many to be the *Cradle of Civilization*.

Amongst the difficulties facing the indigenous peoples of Africa today has been the deleterious shift from traditional food habits to processed and packaged food products of western-owned corporations [9, 10]. Consumption of these food products results in elevated intake of saturated fat, trans-fatty acids and food preservatives, and reduced intake of dietary fibre, vital nutrients and phytochemicals when compared to basic dietary guidelines [11-13]. This shift from traditional foods to westernized food products has been dubbed the *nutrition transition*, and has been directly implicated in the rise of type 2 diabetes, CVD, hypertension, obesity, cancer, and related NCDs throughout Africa [14-16]. Moreover, non-communicable, chronic diseases have not simply replaced infectious and malnutrition-related diseases in Africa. Rather, these vulnerable populations now experience a polarized and protracted *double burden* of disease, where the effects of the *nutrition transition* are additive to the existing infectious disease burden [15, 16].

Food habits are amongst the oldest and deeply ingrained aspects of culture. For example, historical evidence of African food habits dating back to the Stone Age has been found in Olorgesailie, Kenya, a historical site on the floor of the Great Rift Valley, approximately 70km south of Nairobi. Over 5,000 years ago hunter-gatherers, commonly called the *ndorobo*, occupied much of East Africa. The *ndorobo* were assimilated by migrants and lost much of their cultural identity, and this included the loss of knowledge of their food habits [17]. Interestingly, Eaton and Konner [18] investigated dietary shifts over several millennia in Africa and concluded that the human diet was far superior with the hunting and gathering subsistence of paleolithic times as compared with the present-day diet largely based on processed and manufactured foods. Throughout history external influences have brought about changes in African food habits, and this has perhaps never been more so apparent than the present day.

Food habits are based on traditions, but these traditions change with external influence [19]. The faster people adopt new food patterns, the less likely traditional food knowledge will be passed on to the next generation. In general, the loss of traditional food habits results in a decrease in culture-specific food activities, a decrease in dietary diversity and, if history and current trends are of any indication, abysmal reductions in economic circumstances, health status, quality of life, and cultural integrity [20].

Clearly, there is a vital need to investigate and document knowledge of traditional African food habits. This knowledge is necessary to gain an understanding of how traditional dietary patterns could potentially reverse current NCDs trends and improve the health status of indigenous populations throughout Africa, and perhaps abroad. Intensive exploration of traditional African food habits could provide insight into the vast and nutrient-rich diversity of foods available in various regions of this vast continent [12, 21].

Historical, empirical evidence of the richness of traditional African food habits is currently coming to light. Our research group, through Professor Ulrich Oltersdorf [22], recently gained access to a unique collection of data obtained through the activities of the *Max-Planck-Nutrition Research Unit*, previously located in Bumbuli, Tanzania (former Tanganyika). This valuable collection provides evidence of the traditional foods and food habits of various ethnic groups located throughout Kenya, Tanzania and Uganda from the 1930s to the 1960s. The collection includes data pertaining to: traditional foods, food taboos, food preparatory practices, agricultural practices, local markets, cooking methods, nutritional status in relation to dietary intake, and chemical composition of traditional foods and their health implications.

This newly unearthed evidence has the potential to trigger more thorough investigation of traditional African food habits today, and may precipitate the revelation of additional historical knowledge. Moreover, this collection of studies may stimulate the collation of current, original research on traditional African food habits, especially that which is being conducted by indigenous Africans who are currently leading many important investigations. For example, Imbumi *et al* [23] recently reported on the traditional African food habits of the Maasai tribe living in the southern parts of Kenya and the northern district of Tanzania, including traditional staple foods, food preparatory practices, food taboos, and changes in dietary patterns over time. At present, the historical dataset collected by the *Max-Planck-Nutrition Research Unit* and additional historical and novel sources of information on traditional African food habits, has not been amalgamated and has not been made available for access by researchers and the public.

We believe that there is currently a vital need to collect historical and current data on traditional African food habits and present this information via a novel, online collection. Raising awareness and inspiring investigation of traditional African food habits may be of significant cultural and health-related importance for the indigenous people of Africa as well as the global population at large, given the current NCDs

trends sweeping our planet and the potential health-related implications of the traditional African diet.

Therefore, the objectives of the present investigation were: (1) to determine gaps in online collections contributing toward the advancement of knowledge of traditional African food habits, and (2) to determine if opinion leaders in the field of nutritional sciences were aware of the *nutrition transition* and the loss of food culture in Africa, and the potential importance and novelty of creating an online collection of traditional African food habits.

METHODS

I. Systematic review of online collections

A systematic search was performed to determine if there was a gap in online collections focused on disseminating information related to traditional African food habits.

Criteria for considering collections

Databases and websites were included in the systematic review to determine whether they contained data or descriptions on traditional African food habits, including: traditional staple foods, food balance sheets, dietary practices (e.g. preparation, cooking techniques, and flavoring), food taboos and customs, chemical composition of traditional African foods, and classification systems of individual foods (e.g. staple foods, green leafy vegetables, roots and tubers).

Search method

The review of online databases and websites was conducted between June 2005 and April 2006, limited to the English language. The search combined key words: African food habits, Africa, traditional foods, indigenous foods, diets, crops, wild species, food culture, dietary practices, information networks, information systems, databanks, databases, libraries, and involved:

- (1) A systematic search of primary internet search engines: Google, Yahoo, and AltaVista.
- (2) A systematic search of computerized databases: Web of science and Ovid.
- (3) A systematic search of site-specific engines of the following organizations: Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), International Food Policy Research Institute (IFPRI), International Plant Genetic Resources Institute (IPGRI), World Vegetable Center, Consultative Group on International Agricultural Research (CGIAR), International Center for Tropical Agriculture (CIAT), International Center for Agricultural Research in the Dry Areas (ICARDA), International Crop Research Institute for the Semi-arid Tropics (ICRISAT), International Institute of Tropical Agriculture (IITA), International Service for National Agricultural Research (ISNAR) and the South African National Biodiversity Institute (SANBI).

In addition, web sites, databases and articles retrieved were examined for further relevant links and references.

II. Questionnaire administration

A questionnaire was administered to opinion leaders in the nutritional sciences at the 18th International Congress of Nutrition (ICN) in Durban, South Africa, September 2005 (Appendix). The purpose was: (1) To determine if there was awareness of the importance of traditional African food habits within the context of the *nutrition transition* currently plaguing Africa, and (2) To determine if there was general support among this cohort for an online collection of traditional African food habits.

The questionnaire mode included both open and closed format (Yes/No) questions, and was divided into three sections: Section I included standard demographic questions. Section II included questions on the *nutrition transition*, the loss of traditional food habits and related outcomes in Africa, which included a special subsection completed by indigenous African opinion leaders regarding past and present staple foods from their region of origin. Section III included questions regarding the importance of amalgamating and providing data on traditional African food habits *via* an online collection. Participants were shown a sample of potential web pages displayed offline, using a laptop computer and the appropriate software (Explorer ProTM MetaProducts).

The principal investigator distributed and collected all questionnaires. Primary responses from the three sections were analyzed using SPSS software for Windows, Release 11.0.0 (SPSS Inc, Chicago, Illinois).

RESULTS

I. Systematic review of online collections on African food habits

Our systematic review of online collections on traditional African food habits resulted in nine collections being identified. These included: three food composition databases [24-26], two databases providing information on "wild" and semi-domesticated plants of tropical and subtropical drylands, including Africa [27, 28], two databases providing information on various crop species [29, 30], and two online-publication catalogue databases [31, 32]. The nine online databases, and their emphasis pertaining to African food habits, are described in Table 1.

II. Responses from opinion leaders in the nutritional sciences

Participants

Ninety-two questionnaires were completed at the ICN in Durban, South Africa 2005. Mean age of the interviewees was 36.3±9.7 years. All participants had completed tertiary education in the nutritional sciences, with minimum attainment of a Masters degree. The majority (66%) reported Africa as their continent of residence, including 62% from Southern Africa (i.e. South Africa, Angola, Botswana, and Malawi), 15% from West Africa (i.e. Mali, Ghana, and Nigeria), 13% from East Africa (i.e. Uganda,

Ethiopia, and Kenya), 5% from Central Africa (i.e. Cameroon, Republic of Congo), and 5% from North Africa (i.e. Egypt).

Awareness of the nutrition transition

Approximately 86% of respondents agreed that a *nutrition transition* from a traditional to a *westernized* diet is currently afflicting urban sub-Saharan Africa. Only, 14% of the interviewees disagreed on the occurrence of the *nutrition transition*.

Past and present staple foods

Approximately 62% of indigenous African interviewees identified maize as a primary staple food of the past within their region of origin. Rice (25%), legumes (25%), green-leafy vegetables (22%), roots and tubers (22%), meat and poultry (20%), sorghum (17%), millet (17%), and plantains (14%) were also mentioned as past staple foods.

When questioned about *present* staple foods of their region of origin, there were notable reductions in the identification of: sorghum (0% of responses); millet (declined to 8%), green-leafy vegetables (declined to 9%), and legumes (declined to 14%).

Comparison of past and present diet

The majority of interviewees (84%) believed that the traditional African diet was healthier than the current westernized diet. Primary reasons provided as to why the traditional diet could be considered healthier are presented in Figure 1.

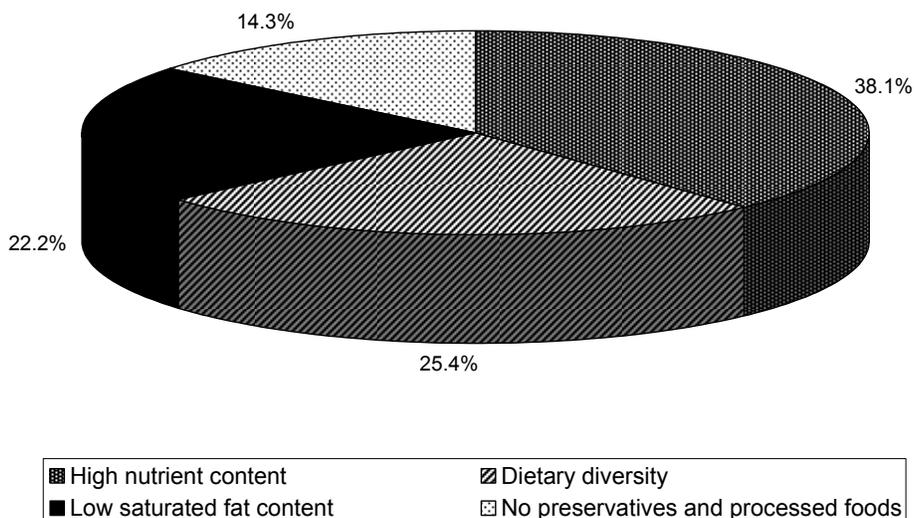


Figure 1. Primary reasons among the ICN interviewees as to why the traditional African diet could be considered healthier.

The traditional African foods most commonly associated with health benefits, as identified by the interviewees included: millet, green leafy vegetables, roots and tubers, fruits, legumes, palm oil, wild “bush” meat, and maize.

On adherence to the traditional African diet, 52% of the participants agreed that the majority of people in Africa (rural and urban) still eat the traditional African diet.

Factors responsible for the nutrition transition and double burden

Primary factors responsible for nutritional deficits in Africans today were identified by the interviewees as: low nutritional value of the current westernized diet (39%); economic pressures related to *westernization/globalization* (32%); and reduced availability and access to quality foods (such as scarcity through lack of options) (25%).

The major factors contributing to the *double burden* epidemic as noted by the cohort, included: urbanization, associated economic pressure and maldistribution of wealth (33%), adoption of western cultural beliefs (17%), adoption of an unhealthy monotonous diet including excessive energy consumption in urban areas and under-nutrition in rural areas (16%). Several interviewees identified lack of available infrastructure (14%), including lack of basic healthcare, loss of arable land/habitat, loss of biodiversity and reduced access to quality foods as the major causes of the double burden. Existing disease burden (7%) and lack of knowledge of what is considered as ‘healthy diet’ (7%) were also identified as influential factors.

Loss of knowledge of traditional African food habits

The majority of the interviewees (78%) believed that knowledge of traditional African food habits is being lost. Approximately 56% believed that the lack of promotion, documentation and research of indigenous foods in Africa was the main source for the loss of knowledge. Other reasons identified included *westernization/globalization* and/or colonization (35%), ignorance and stigma of traditional food (5%), and international food aid programs (5%).

Importance of an online collection of traditional African food habits

Open-ended questioning revealed that the online collection could serve as an important research and educational tool (70%). Several interviewees commented that an online collection could support preservation of knowledge of African food habits (17%) including their potential health implications (13%).

The need for an online collection

The opinion leaders were virtually unanimous (88%) in suggesting that an online collection of traditional African food habits should be used for educational purposes.

The vast majority of opinion leaders (82%) believed that a gap currently exists in online empirical evidence related to traditional African food habits. The majority of respondents (69%) were not aware of scientists currently investigating traditional

African food habits. The vast majority of interviewees (92%) indicated that they would make use of a novel online collection, if made available.

DISCUSSION

The investigation revealed several important findings that support our proposal for a novel, online collection of traditional African food habits. The systematic review performed revealed nine online databases that provide some data pertaining to certain aspects of traditional African foods (Table 1). All of these collections have important implications, but fundamentally differ from our current vision of an online collection of traditional African food habits designed to stimulate education and research of food habits and their health implications, and provide a well-rounded forum in which such information can be presented and shared. According to our systematic search, there are currently no online collections that have an overall focus on traditional African food habits. Moreover, 82% of the opinion leaders at the 18th INC 2005 in Durban, South Africa believed that a gap currently exists in this area.

Overwhelmingly, the opinion leaders surveyed believed that the traditional African diet was superior to the increasingly prevalent and insidious *westernized* diet, citing 'nutrient density and diversity', 'low saturated fat' and 'no preservatives' as key determinants of health. Moreover, the indigenous African experts interviewed noted reduced millet and sorghum consumption and increased wheat and rice consumption as primary staple foods within their regions of origin. Empirical investigations have demonstrated the superior nutritional indices of millet and sorghum as compared to rice and wheat [33-38]. The notable finding provides one example of how staple foods in Africa are shifting toward an unfavorable direction.

According to the interviewees, the adoption of western values, urbanization, economic pressures, maldistribution of wealth, and scarcity through lack of choice were primary factors driving the *nutrition transition* and the related *double burden epidemic* in Africa today. The increasing prevalence of NCDs associated with these socio-economic pressures has been well described [9, 12, 39-41]. Loss of cultural ties, traditional knowledge and traditional food resources occurs with urbanization [42]. Moreover, Bourne *et al.* [4, 40] reported that in South Africa the *westernization* of diet is occurring in rural areas, and is not only confined to urban centers.

It is essential to provide data on the nutrient and dietary intake of Africans prior to the onset of the *nutrition transition* [6]. According to Popkin [43], the increased consumption in refined foods and fats among urban Africans is due to the appearance of dietary shifts. The occurrence of a dietary shift was also highlighted in the stakeholder survey. Documentation and presentation of these new dietary patterns of Africans could be integrated into our vision of a novel online collection, potentially providing further support for the traditional African diet. Comparative data on food quality and health status during periods of transition may enhance advocacy for the traditional diet amongst health care, and nutrition intervention programs throughout Africa, and perhaps abroad, in countries drawing African migrants and refugees.

Globalization of culture and commercial activities promulgates a *westernization* of developing-country food systems and diets [44]. The complex set of industrial and modernizing influences involved lead to a delocalization of food supply, which has been described as a major determinant of dietary change [45]. With the increasing networks of socioeconomic and political interdependencies, a decreasing diversity of food items are consumed [20]. Our investigative group, including the principle investigator (V.R.) and four co-investigators in the field of nutritional sciences (U.O., I.E., M.L.W. and A.K.), believes that indigenous knowledge regarding food choices should be amalgamated with historical empirical knowledge and novel scientific investigation of the chemical composition of foods, including nutrients and non-nutrients (fibers, polyphenols, etc.). This combination of indigenous *and* scientific knowledge may increase the marketability of traditional African food items. For example, previous marketing of culture-specific food items *via* traditional knowledge *and* scientific inquiry have led to increased advocacy and popularity of the Mediterranean and *Japanese* cuisines.

The high quality and diversity of the traditional African diet was noted by early European travellers [46, 47]. For example, Livingstone was surprised to see such a variety of foods eaten by the *Wagogo* people in Central Tanzania [46, 47]. The majority of the interviewees shared the opinion that the traditional African diet was healthier due to its high nutrient content, high diversity, low saturated fat content and the absence of preservatives. The sensory and culinary properties of local food crop varieties, the diversity of the foods used and the potential genetic variations in nutrient composition within neglected and underutilized species are further examples of the type of information which should be presented via an online collection.

The diversity of indigenous crops, wild plants and animal species available in most tropical countries, in addition to providing essential nutrients, presumably offer health benefits [48, 49]. Several empirical investigations have associated traditional African items with health benefits, including various species of green leafy vegetables [50], grain legumes[51], palm fruit [52, 53] and millets [34]. These food items were identified as healthy by some of our interviewees at the ICN.

In summary, the investigation revealed a clear need for a novel, online collection of traditional African food habits. This collection could serve as an important medium for education, research, and international networking, according to experts in the nutritional sciences surveyed at the recent ICN. The majority of the respondents believed that knowledge of traditional African food habits is being lost, and that they would make use of a novel, online collection on traditional African food habits, if available.

ACKNOWLEDGEMENTS

The unique, historical unpublished dataset collected by Professor Ulrich Oltersdorf from the 1930s to 1960s from the *Max-Planck-Nutrition Research Unit*, Bumbuli, Tanzania, is now available *via* our novel, online collection on traditional African food habits at: www.healthyeatingclub.org/Africa

We will continue to add novel information describing traditional African food habits as such information is put forth.

In addition, we would like to sincerely thank Ms. Barbara Feeney for her valuable contributions toward the preparation of this manuscript.

Table 1: The major online collections on African food habits.

Database (time series)	Available data related to African food habits
AJOL ³¹ 1998 - present	Database of 230 African-published journals
IPGRI-online publications catalogue/database ³² 1977 - present	Publications on indigenous/traditional food systems and documentation about indigenous species/foods for all of Africa
FAOSTAT ²⁴ 1961 - present	Food balance sheets for all African countries, including information on: -Domestic supply -Domestic utilization -Per capita supply
AFROFOODS * ²⁵ 1999 - 1952	Food composition table for various African countries
SAFOODS ²⁶ Published in 1991	Energy, macronutrient composition of different foods consumed by people in South Africa
SEPASAL ²⁷ since 1981	Information on more than 6300 useful <i>wild</i> and semi-domesticated plants of tropical and subtropical drylands including Africa (scientific name, plant family, geographical distribution, ecology, use of plants, properties and chemical analysis)
PROTABASE ²⁸ initiated in 2000	Review articles for nearly 400 African plant species (botanical names and botanical descriptions to it's useful properties, cultivation and potential as a crop)
NewCROP ³⁰ since 1995	Crop database on scientific crop profiles including African species (crops by name, uses including food use, geography, commodity, cultural practices, nutritional value)
Famine food database ²⁹ since 1995	Information on African crops (scientific name, plant family, vernacular, geographical distribution, ecology, use and preparation of plants)

*one of INFOODS (International Network of Food Data Systems) regional data centers;

ANNEX I



Questionnaire on African Food Habits

My name is Verena Raschke and I am doing my PhD cojointly at University of Vienna (Austria) and Monash University (Australia) with Prof. Elmadfa and Prof. Wahlqvist.

I was recently granted access through Professor Ulrich Oltersdorf to a unique collection of data obtained through the research activities of the *Max-Planck-Nutrition Research Unit*, Bumbuli, Tanzania (former Tanganyika) from the 1930s to the 1960s.

My project is based on a valuable collection of empirical data on traditional foods and food habits throughout Kenya, Tanzania (including Zanzibar Island and Pemba Island) and Uganda during this period, including information on: traditional food items, food taboos, food preparatory practices, agricultural practices, local markets, cooking methods, nutritional status in relation to dietary intake, and chemical composition of traditional foods and their health implications.

These unpublished data have been stored at the University of Karlsruhe for over 30 years and through my PhD, I have been given the exciting opportunity to systematically review the literature and dataset and make it available to the public via an interactive web site.

This questionnaire will assess your thoughts about the development of a web site on FOOD HABITS IN AFRICA and whether it could be of future importance?

Section I:

1. Gender:
 - Male
 - Female
2. Country of residence:
3. Age:
4. Highest level of education:

Section II:

Subsection for opinion leaders indigenous to Africa

Which region/province are you from:

1. The main staple food items in my home region were... (list below)

2. Today, the main staple food items in my home region are... (list below)

General questionnaire: for all 18th ICN opinion leaders

3. Do you think that the traditional African diet was healthy?
 - If yes, why:
 - No

4. Do you think the *new, westernized* African diet is better compared to the traditional African diet?
 - Yes
 - No

5. Do you think that the majority of people in Africa still eat the traditional African diet?
 - Yes
 - Not

6. I think the major problems of the African diet today are.....
 (3 entries are possible)
 - a.)
 - b.)
 - c.)

7. Is the *nutrition transition** happening throughout Africa?
 - Yes
 - No

*adverse dietary shift (e.g. shifts in structure of the diets towards a greater role for higher fat, added sugar foods, reduced fruit and vegetable intake, reduced fibre intake, greater energy density and greater saturated fat intake) which is dominated by nutrition related non-communicable disease (NR-NCDs)

8. The major causes of the *double burden*** in Africa today are.....
 (3 entries are possible)
 a.)
 b.)
 c.)

**Co-existence of under nutrition, infectious disease with nutrition related non-communicable disease (NR-NCDs) such as for example high blood pressure, obesity, type II diabetes mellitus

9. What are the main reasons for a change in traditional African food habits?
 (3 entries are possible)
 a.)
 b.)
 c.)
10. Do you think that the traditional knowledge of African food habits is being lost?
 Yes,
 because.....

 No

Section III: Web site project on East African food habits

11. What do you think about my project, of making baseline information on East African food habits from the 1930s to 1960s available via the internet?

12. The main focus on the web site should be:

13. The knowledge of African food habits is important because:

14. Does a gap on online empirical and precise data on African food habits exist?
 Yes
 No

15. Would you make use of the web site?

- Yes
- No

16. Are you aware of scientists who study African food habits?

- If yes, can you name them and provide a contact address?

.....

....

- No

17. Are you interested in more information about the project?

- Yes
- No

18. Are you interested to receive an electronic newsletter about the project news?

- Yes ,

my e-mail address:.....@.....

- No

Thank you very much for your participation & time!

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REFERENCES

1. **Murray C and A Lopez** Mortality by cause for eight regions of the world: global burden of disease study. *Lancet* 1997; **349**: 1269-1276
2. **World Health Organization** Diet, physical activity and health. Fifty-five World Health Assembly Report A55/16 Geneva: 2002
3. **Bovet P, Ross A, Gervasoni J, Mkamba, M, Mtasiwa, DM, Lengeler, C, Whiting, D and F Paccaud** Distribution of blood pressure, body mass index, and smoking of Dar es Salaam, Tanzania, and associations with socioeconomic status. *Int. Epidemiol. Assoc.* 2002; **31**: 240-247
4. **Bourne LT, Lambert EV and K Steyn** Where does the black population of South Africa stand on the nutrition transition? *Public Health Nutr.* 2002; **5**: 157-162
5. **Sande M** Cardiovascular disease in sub-Saharan Africa: a disaster waiting to happen. *Neth J Med.* 2003; **61**: 32-36
6. **Popkin BM** Part II. What is unique about the experience in low- and middle-income less-industrialized countries compared with very-high-income industrialized countries? The shift in stages of the nutrition transition in the developing world differs from past experiences! *Public Health Nutr.* 2002; **5**: 205-214
7. **Voster H, Bourne L, Venter C and W Oosthuizen** Contribution of Nutrition to the Health Transition in Developing Countries: A Framework for Research and Intervention. *Nutr Rev.* 1999; **57**: 341-349
8. **Guest R** The shackled continent: Africa's past, present and future. Macmillan, London. 2004
9. **Maletnlema T** A Tanzanian perspective on the nutrition transition and its implication for health. *Public Health Nutr.* 2002; **5**: 163-168
10. **Popkin BM, Lu B and F Zhai** Understanding the nutrition transition: measuring rapid dietary changes in transitional countries. *Public Health Nutr.* 2002; **5**: 947-993
11. **Shetty P** Diet nutrition and chronic disease: lessons from contrasting worlds. John, Wiley and Sons, Chichester, UK. 1997
12. **Drewnowski A and B Popkin** The nutrition transition: new trends in the global diet. *Nutr Rev.* 1997; **55**: 31-43
13. **Walker A and I Segal** Health/ill-health transition in less privileged populations: what does the future hold? *J R Coll Physicians Lond.* 1997; **31**: 392-395
14. **WHO** (World Health Organization). Globalization, diet and noncommunicable disease. Geneva: 2002; 1-185.
15. **Popkin B** An overview of the nutrition transition and its health implications: The Bellagio meeting. *Public Health Nutr.* 2002; **5**: 93-103
16. **Popkin BM** The nutrition transition and prevention of diet related disease in Asia and the Pacific. *Food Nutr Bull.* 2001; **22**: S1-58

17. **Katz SH and WW Weaver** Encyclopedia of Food and Culture. Charles Scibner's Sons, The Gale Group Inc., Thomson Learning Inc., New York. 2003
18. **Eaton S and M Konner** Paleolithic nutrition. *N Engl J Med.* 1985; **312**: 283-290
19. **Oniang'o RK** Food habits in Kenya: The effects of change and attendant methodological problems. *Appetite* 1999; **32**: 93-96
20. **Kuhnlein H and O Receveur** Dietary change and traditional food systems of indigenous peoples. *Annu Rev Nutr.* 1996; **16**: 417-442
21. **Popkin BM** The nutrition transition and its health implications in lower income countries. *Public Health Nutr.* 1998; **1**: 5-21
22. **Oltersdorf U** Comparison of Nutrient Intakes in East Africa. The Human Biology of Environmental Change, Blantyre, Malawi: International Biological Programme, Human Adaptability section. 1971; 51-59
23. **Imbumi M, Saitabu H and P Maundu** Maasai traditional foods: A look at diets in the Maasai culture. *Ann Nutr Metab.* 19-23 September 2005; **49 (Suppl. 1)**: 381
24. **FAO** (Food and Agriculture Organization of the United Nations). FAO Statistical Databases (FAOSTAT) On-line. 2006. Available at: <http://faostat.fao.org/>
25. **FAO** (Food and Agriculture Organization of the United Nation). International Network of Food Data Systems (INFOODS) On-line. Agriculture Biosecurity Nutrition and Consumer Department 2006. Available at: http://www.fao.org/infoods/tables_africa_en.stm
26. **MRC** (Medical Research Council South Africa). South African Food Composition Database (SAFOODS) On-line. 2006. Available at: <http://www.mrc.ac.za/FoodComp/>
27. **Royal Botanic Gardens Kew** Survey of Economic Plants for Arid and Semi-Arid Lands (SEPASAL) On-line. Royal Botanic Gardens Kew, Centre for Economic Botany (CEB) 2006. Available at: <http://www.rbgekew.org.uk/ceb/sepasal/internet/>
28. **Prota Foundation** Resources of Tropical Africa (PROTABASE) 2006. Available at: <http://database.prota.org/search.htm>
29. **Freedman R** The Famine Foods Database On-line. Purdue University Center for New Crops and Plant Products 1995. Available at: http://www.hort.purdue.edu/newcrop/faminefoods/ff_home.html
30. **Purdue University Center for New Crops and Plant Products** New Crops Resource Online Program (NewCROP). Purdue University, Department of Horticulture and Landscape Architecture 1995. Available at: <http://www.hort.purdue.edu/newcrop/SearchEngine.html>
31. **AJOL** (African Journals Online) NISC SA (National Inquiry Services Centre) 2006. Available at: <http://www.ajol.info/>
32. **IPGRI** (International Plant Genetic Resources Institute) On-line Publications-Catalogue. 2006. Available at: <http://www.ipgri.cgiar.org/>
33. **Dicko M, Hilhorst R, Gruppen H, Traore AS, Laane C, van Berkel WJH and**

- AGJ Voragen** Comparison of Content in Phenolic Compounds, Polyphenol Oxidase, and Peroxidase in Grains of Fifty Sorghum Varieties from Burkina Faso. *J Agric Food Chem.* 2002; **50**: 3780 -3788
34. **Nishizawa N, Shimanuki S, Fujihashi H, Watanabe H, Fudamoto Y and T Nagasawa** Proso millet protein elevates high plasma level of high-density lipoprotein: a new food function of proso millet. *Biomed Environ Sci.* 1996; **9**: 209-212
35. **Gooneratne J, Munasinghe L and W Senevirathne** Millet bran and corn bran lowers plasma total and LDL cholesterol levels in hypercholesterimic subjects. *Ann Nutr Metab.* 2005; **49 (Suppl. 1)**: 304
36. **Kurup P and S Krishnamurthy** Glycemic response and lipemic index of rice, raggi and tapioca as compared to wheat diet in human. *Indian J Exp Biol.* 1993; **31**: 291-293
37. **Hulse J, Laing E and O Pearson** Sorghum and the millets: their composition and nutritive value. New York: Academic Press 1980
38. **FAO** (Food and Agriculture Organization of the United Nations). Sorghum and millets in human nutrition. Rome: Food and Agriculture Organization of the United Nations (FAO) 1995
39. **Levitt N, Katzenellenbogen J, Bradshaw D, Hoffman MN and F Bonnici** The prevalence and identification of risk factors for NIDDM in urban Africans in Cape Town, South Africa. American Diabetes Association. *Diabetes Care* 1993; **16**: 601-607
40. **Bourne LT, Langenhoven ML and K Steyn** Nutritional Intake of the African Population of the Cape Peninsula, South Africa: the BRISK study. *Cent Afr J Med.* 1993; **39**: 238-247
41. **Trowell H** From normotension to hypertension in Kenyans and Ugandans 1928-1978. *East Afr Med J.* 1980; **57**: 167-173
42. **Kuhnlein HV and T Johns** Northwest African and Middle Eastern food and dietary change of indigenous peoples. *Asia Pac J Clin Nutr.* 2003; **12**: 344-349
43. **Popkin B** The nutrition transition in low-income countries: an emerging crisis. *Nutr Rev.* 1994; **52**: 285-298
44. **Cannon G** Nutrition: The new world disorder. *Asia Pac J Clin Nutr.* 2002; **11 (Supp 1)**: 498-509
45. **Pelto G and P Pelto** Diet and Delocalization: Diet Changes since 1750. *J Interdiscip Hist.* 1983; **14**: 507-528
46. **Schaffer R and F Finklestein** The food and growth of Gogo children. Stencilled Paper 1963; 1-10
47. **Jelliffe D, Jelliffe E, Benett F and R White** Ecology of childhood disease in the Karamojong in Uganda. *Arch Environ Health.* 1964; **9**: 25-36
48. **Haltloy A, Hallund J, Diarra M and A Oshaug** Food variety, socioeconomic status and nutritional status in urban and rural areas in Koutialia (Mali). *Public Health Nutr.* 2000; **57**: 57-65
49. **Ogle B, Hung P and H Tuet** Significance of wild vegetables in micronutrient intakes of women in Vietnam: an analysis of food variety. *Asia Pac J Clin Nutr.* 2001; **10**: 21-30

50. **James A, Chweya J and P Eyzaguirre In:** Chweya J and Eyzaguirre P (Ed). *The biodiversity of traditional green leafy vegetables*. Rome, Italy: International Plant Genetics Resources Institute (IPGRI); 1999:1-6
51. **Zulet M, Macarulla M, Portillo M, Noel-Suberville C, Higuere P and JA Martinez** Lipid and glucose utilization in hypercholesterolemic rats fed a diet containing heated chickpea (*Cicer arietinum L.*). *Int J Vitam Nutr Res.* 1999; **69**: 403-411
52. **Wattanapenpaiboon N and M Wahlqvist** Phytonutrient deficiency: the place of palm fruit. *Asia Pac J Clin Nutr.* 2003; **12**: 363-368
53. **Solomons N and M Orozco** Alleviation of vitamin A deficiency with palm fruit and its products. *Asia Pac J Clin Nutr.* 2003; **12**: 373-338