

Case study 1

Traditional foods of the Pacific: Go Local, a case study in Pohnpei, Federated States of Micronesia

Lois Englberger and Eminher Johnson

Context and statement of the problem

Overall background

In recent years, throughout the Pacific Islands there has been an alarming shift towards consumption of low quality imported processed foods accompanied by a neglect of traditional food systems. This has led to serious health problems, food security risk and losses of agricultural biodiversity, traditional knowledge, customs and culture. Global and regional problems of climate change, population pressure, food and fuel price increases and unstable economic conditions exacerbate the Pacific's problems related to food imports and highlight the need to protect traditional food systems and agricultural biodiversity (Pacific Food Summit, 2010; Hezel, 2010; Coyne, 2000).

This case study focuses on Pohnpei, one of the four states of the Federated States of Micronesia (FSM), a nation of 607 islands (volcanic and atoll)¹ spread over a million square miles of water in the western Pacific Ocean. FSM's total population is ~107,000, including Pohnpei, the seat of the national capital, ~34,500; Chuuk 53,600; Yap 11,200 and Kosrae 7,700 (FSM, 2002) and includes many cultural identities. The nation was established in 1986, supported by a Compact of Free Association with the United States. Subsistence farming and fishing are the primary economic activities (CIA, 2011).

Pohnpei State, total land area 355 sq km (Englberger et al., 2009b), consists of the main island Pohnpei and five outer atoll island groups. The main island has a rugged mountainous terrain, year-round heavy rainfall, warm temperatures and rich tropical vegetation.

Dietary and life-style changes and related health problems

Pohnpei has remarkable plant diversity with 133 breadfruit varieties, 55 bananas, 171 yams, 24 giant swamp taros, nine tapiocas and many pandanus varieties documented (Adam et al., 2003; Raynor, 1991). The traditional diet was based on these crops, coconut, fish and seafood, and fresh fruits and sugar cane and pandanus as snacks. However, along with increasing modernization in the

1970s, there has been a neglect of traditional foods and a shift towards the consumption of unhealthy imported processed foods (Englberger et al., 2003d). The introduction of easily prepared, costly, imported processed western foods decreased the need of growing traditional healthy food.

White rice, in particular, has become a staple food, along with white flour. The consumption of sweet, salty and refined foods, as well as imported fats and fatty meats has also dramatically increased. Lifestyles have changed: physical activity has decreased, along with an increase in office jobs, shopping for food, and use of motorized vehicles, boats, and mechanized equipment. These dietary and lifestyle changes have led to serious problems of overweight and obesity, diabetes, heart disease, cancer, vitamin A deficiency (VAD) and anaemia (WHO, 2008; Englberger et al., 2003d, 2009b). Over 70 per cent of Pohnpei adults between 25 and 64 years of age are overweight (with 42.6 per cent obese) and 32.1 per cent have diabetes (WHO, 2008), causing increased health costs.

While few Pohnpeians reach the World Health Organization (WHO) criteria for severe vitamin A deficiency (WHO, 2009a),² over half of Pohnpei children between 24 and 48 months old in a population-based survey were identified as VAD, with low serum retinol levels ($< 20 \mu\text{g}/\text{dl}$) (Yamamura et al., 2004) and increased risk of contracting eye infections and other health conditions.

Why agricultural biodiversity was used as a solution

In 1998 efforts were initiated to identify local foods that could be promoted to alleviate problems associated with VAD deficiency. Local experts mentioned the rare Karat and other yellow-fleshed bananas. Analyses showed that Karat, a variety traditionally given to infants, is rich in beta-carotene, the most important of the provitamin A carotenoids, with amounts much higher than in common white-fleshed bananas (Englberger, 2001). Karat soon received international acclaim for its rich nutrient content (Coghlan, 2004; Kuhnlein, 2004), creating additional interest at home. Further studies showed that there are many varieties of yellow-fleshed banana, giant swamp taro, breadfruit and pandanus that are rich in beta-carotene and other carotenoids, nutrients and fibre (Table C1.1) (Newilah et al., 2008; Englberger et al., 2003a, b, c, 2006, 2008, 2009a; Kritchevsky, 1999; McLaren and Frigg, 2001; Coyne et al., 2005; WCRF/AICR, 2007).

Although familiar with many of these traditional crop varieties, Pohnpeians (and other Micronesians) were largely unaware of their inherent health benefits. As one Pohnpei farmer said, “If we farmers had known about the importance of the yellow-fleshed varieties, we would have planted more.”

The study mainly focuses on terrestrial species, but marine agricultural biodiversity was also taken into account as it documented and promoted fish, seafood consumption, and the traditional animal protein of the islands. Consequently, both these types of agricultural biodiversity³ were used as a solution to the problem of imported foods through the overall “Go Local” promotion of locally-available foods, from land and sea.



Figure C1.1 Traditional knowledge and skills are preserved in the community by collecting, sharing, and distributing different local varieties of banana. Photo credit: Chizuru Seki

Delivery mechanism to mobilize agricultural biodiversity

Our campaign used an inter-agency, ethnographic, participatory, and community-based approach in understanding the problems and addressing the solutions. This approach also increased stakeholder involvement. An important early activity was forming the Island Food Community of Pohnpei (IFCP) as a non-governmental organization to coordinate activities (IFCP, 2004).

Two slogans were all-important: the first, “Go Yellow”, focused on the yellow-fleshed varieties, including Karat (Englberger, 2006; IFCP and Micronesian Seminar, 2006); the second, “Let’s Go Local” was broader, promoting production and consumption of all local food. To strengthen the campaign, the “CHEEF” acronym was created to refer to the benefits of local food: culture, health, environment, economic and food security (Englberger et al., 2010c).

Many methods were used to mobilize agricultural biodiversity including: workshops; container garden demonstration plots; school visits; planting material distribution; planting, cooking and weight loss competitions; posters; youth clubs; breastfeeding clubs; billboards; mass media (newspaper, radio, television, video, emails, and the website www.islandfood.org); leaflets, newsletters and booklets; songs; recipes; national postal stamps of Karat, other yellow-fleshed bananas and other foods; postcards, telephone cards, t-shirts, pens and pencils; gene bank; and charcoal ovens (Englberger et al., 2009b, 2010b, c, d; Ormerod, 2006; Hanson, 2010).

In 2005, the IFCP joined a global project on traditional food systems and health, using specific guidelines (Kuhnlein et al., 2006) and led by the Centre

Table C1.1 Carotenoid content of selected Pohpei, FSM traditional staple food cultivars compared to rice ($\mu\text{g}/100$ g edible portion)

Cultivar	Species	Flesh color ^a	β -carotene	α -carotene	β -crypto xanthin	β -carotene equivalents ^b	RE ^c	RAE ^d	Total Carotenoids ^e
Banana									
<i>Utin Iap</i>	<i>Musa spp</i>	Orange: 15	8508	na	na	8508	1418	709	na
<i>Karat</i>	<i>Musa spp</i>	Yellow/orange: 8	2230	455	30	2473	412	206	4320
Giant swamp taro									
<i>Mwaling Tekatek Weitaha</i>	<i>Cyrtosperma merkusii</i>	Yellow: 1	4486	na	na	4486	748	374	na
<i>Mwalingin Wel</i>	<i>Cyrtosperma merkusii</i>	Yellow: 4	2930	2040	120	4010	668	334	5630
Breadfruit									
<i>Mei Kole</i>	<i>Artocarpus mariannensis</i>	Yellow	868	142		939	132	78	na
Pandanus									
<i>Luarmue</i>	<i>Pandanus tectorius</i>	Yellow	310	50	20	345	58	29	5200
Imported food									
Rice, white or brown	<i>Oryza sativa</i>	White	na	na	na	0	0	0	0

na – not analyzed

Notes: Analyses were conducted at different laboratories, see published papers. All used state-of-the-art techniques, including high performance liquid chromatography (HPLC). Samples were as eaten: raw ripe (banana, pandanus); cooked ripe (breadfruit) and cooked as mature (taro). All samples were composite samples: 3-6 fruits or corns per sample, collected from Pohpei State, Federated States of Micronesia. Data are from: Englberger et al. 2009a (pandanus), Englberger et al. 2008 (giant swamp taro), Englberger et al. 2006 (banana), Englberger et al. 2003a (breadfruit). Imported food: rice: Dignan et al. 2004. Imported rice has now become a common staple food in Pohpei.

a Raw flesh color was described visually and estimated using the DSM Yolk Color Fan, numbers ranging from 1 to 15 for increasing coloration of yellow and orange.

b β -carotene equivalents: content of β -carotene plus half of α -carotene and β -cryptoxanthin.

c Retinol Equivalents (conversion factor 6:1 from β -carotene equivalents to RE). The estimated Recommended Dietary Intake (RDI) for a non-pregnant, non-lactating female is 500 μg RE/day and for a child 1-3 years old is 400 μg /day (FAO/WHO 2002).

d Retinol Activity Equivalents (conversion factor 12:1 from β -carotene equivalents to RAE)

e This includes estimates of identified and unidentified carotenoids levels.

for Indigenous Peoples' Nutrition and Environment (CINE). A target Pohnpei community in Mand,⁴ Madolenihmw, was selected and a three-month documentation of the traditional food system and health problems was carried out, followed by a two-year intervention (Englberger et al., 2009b, 2010a). Much was learned in this project, which has contributed to our on-going work.

In developing the methods, the focus was on maximizing resources, capturing interest and increasing involvement. For example, posters hung up in public places could be seen for an extended period and media messages reached many people.

Evidence of impact of the intervention

There is substantial evidence of the intervention's impact. Karat was not sold at local markets prior to the discovery in 1998 of its rich nutrient content. Since 1999, Karat has appeared in the markets and its availability is steadily increasing. In 2006, Karat was sold in eight of 14 local markets (Parvanta et al., 2006). Currently, Karat is being sold and is available in all the local food markets and other food marts that also carry imported food.

Another Pohnpei case study as part of the CINE global health study showed that in the target community there were significant increases in banana and giant swamp taro consumption and dietary diversity, and an improved attitude towards local foods (Kaufer et al., 2010; Englberger et al., 2010a). It is notable that in 2009, two years after the intervention, a further assessment showed that the giant swamp taro consumption increase was sustained and imported foods consumption significantly decreased from the first assessment in 2005 (Bittenbender, 2010).

An increase in cooked local food take-outs is now seen (Naik, 2008), and local vendors report that their sales have been helped by the campaign. The daily available selection of cooked local foods includes: pounded banana, banana cream, pilolo, mashed giant swamp taro, fresh sashimi both reef and ocean fish, fried or sautéed reef fish/tuna, coconut cream clamps, tapioca, soft taro, yam in different recipes, coconuts, local cinnamon tea, etc. These locally cooked foods are mostly being sold on roadside in town and also in urban communities.

It is at present too early to report the extent to which these increases have impacted the consumption and utilization of local food.

Efforts for scaling up

Since the initial project in Mand Community started in 2005, the project has been taken to five further Pohnpei communities, including a Pohnpei atoll, and to communities in the other three FSM states (Johnson, 2010; Suda et al., 2010; Tara, 2010). There are now many more requests for the IFCP to speak about their work and approach to schools, communities and other groups.

Additionally interest in the "Go Local" approach has spread to other Pacific Island countries where "Go Local" workshops have been held (SPC LRD, 2008) and projects have been planned (WHO, 2009a). The approach has been presented



Figure C1.2 Pandanus planting to prevent soil erosion. Photo credit: Chizuru Seki

at many regional and international meetings (Pacific Food Summit, 2010) and the Food and Agriculture Organization (FAO) asked IFCP to prepare guidelines on how to implement a “Go Local” project so that the FSM experience could be taken to other Pacific Island countries (Englberger, 2011). In addition, our work identifying carotenoid-rich banana varieties has created interest in similar research elsewhere (Fungo et al., 2010; Amorim et al., 2009; Davey et al., 2009).

There are considerable barriers for scaling up: limited funding and resources, geographic dispersion, and different cultures and languages within the FSM and other Pacific Island cultures, but the movement is definitely spreading.

The FSM National Government approved two projects to be carried out in 2012 under the Resources and Development (R&D) Department: the Coconut Rehabilitation and FSM Food Security projects. During their meeting, which took place in 2011, the projects adopted the Island Food Let’s “Go Local” approach inviting R&D experts to work on these projects along with other relevant partners.

Stakeholder involvement to ensure success

The IFCP was built upon an inter-agency approach with wide stakeholder involvement, involving governmental, non-governmental and private sector agencies along with community participation (IFCP, 2004). Intervention activities have involved wide participation from the agriculture, education and health sectors, as well as other groups. Such activities include farmers’

workshops, classroom presentations, inter-agency meetings, information boxes and poster displays at local shops. Stakeholders are involved through an ongoing awareness campaign to increase local food production and consumption at home, in the community, state, national and international functions, e.g. FAO's "Go Local" tool kit as guidelines to help in scaling up the non-communicable diseases (NCD) prevention strategies. They are also asked to become IFCP members, providing membership fees and strengthening ties and commitments.

Impact on relevant policies

Prior to the launching of the "Go Local" campaign, there was never any promotion on utilizing local food. After these local foods were analyzed and proved to be healthy, it boosted an initiative to raise this awareness that led to finding a slogan that can best describe the goal of this campaign.

The "Go Local" awareness has been heard and made a great impact on community, state and national policies. In 2010, Mand Community adopted a policy that bans serving soft drinks at community functions, followed by similar policies by the Pingelap People's Organization, and the Kolonia Kosrae Congregational Church.

In 2005, the Pohnpei State Governor proclaimed Karat as the Pohnpei State Banana (David, 2005) and in 2010, the FSM President proclaimed that the utilization of local foods is encouraged at all government events and festivities (Mori, 2010).

Key lessons learned

Repetition, colour, fun, many types of activities, using mass media but also face-to-face communication, and the community- and inter-agency approach with wide stakeholder involvement are all used. Research on the nutrient composition of foods and varietal differences is important in creating interest in local food crops and to expand data available on traditional knowledge and characterization of the food crops and varieties. As always, research is needed for project evaluation, for example, status on local food intake and planting of rare varieties. Social marketing tools, such as our IFCP Go Local t-shirts, pens and pencils, attract great interest and provide entry points for discussions.

A key lesson is that passion and dedication are needed, and that the message needs to reach the hearts of the people in order to start to change attitudes and behaviour by having champions in positions of influence.

Finally, it is important to continue to share the overall message, to "Go Local" for all of the "CHEEF" benefits of local food. This way agricultural biodiversity can be effectively used to improve health and nutrition.

Acknowledgements

Warm thanks are extended to all community, government and non-government agency partners and funding agencies and to Harriet V. Kuhnlein for reviewing the manuscript.

The photos (Figures C1.1 and C1.2) are from two ongoing projects in Pohnpei: “Pandanus planting for climate change adaptation” and “Food security and income generation for women”. This tree crop produces nutrient-rich fruits; it can be planted close to the coastline to prevent erosion and leaves are used to handcraft mats, jewellery, baskets and purses.

Notes

- 1 An atoll is a ring-shaped low-lying coral island or group of islands, often consisting of only a narrow strip of land with seawater on both sides, circling a lagoon. Atoll island climates are considered among the harshest in the world due to the poor rainfall and poor soils.
- 2 Vitamin A deficiency increases vulnerability to infection and poor eye health and vision (McLaren and Frigg, 2001).
- 3 Agricultural biodiversity has been defined as “the variety and variability of animals, plants and micro-organisms that are used directly or indirectly for food and agriculture, including crops, livestock, forestry and fisheries” (FAO, 2004).
- 4 Mand Community is a rural community reached by a 40-minute drive on a paved road from the commercial centre of the main island Pohnpei.

References

- Adam, I.E., Balick, M.J. and Lee, R.A. (2003) ‘Useful plants of Pohnpei: A literature survey and database’, New York, Institute of Economic Botany, New York Botanical Garden.
- Amorim, E.P., Vilarinhos, A.D., Cohen, K.O., Amorim, V.B.O., dos Santos-Serejo, J.A., e Silva, S.O., Pestana, K.N., dos Santos, V.J., Paes, N.S., Monte, D.C., and dos Reis, R.V. (2009) ‘Genetic diversity of carotenoid-rich bananas evaluated by Diversity Arrays Technology (DArT)’, *Genetics and Molecular Biology*, vol 32, no 1, pp.96–103.
- Bittenbender, A. (2010) ‘Evaluation of the Mand Nutrition and Local Food Promotion Project: Pohnpei, Federated States of Micronesia’, Internship Report Submitted to the Faculty of the Mel and Enid Zuckerman College of Public Health in Partial Fulfillment of the Requirements for the Degree of Masters of Public Health, University of Arizona.
- Central Intelligence Agency (2011) *CIA Factbook*, www.cia.gov/library/publications/the-world-factbook/geos/fm.html, accessed January 20, 2011.
- Coghlan, A. (2004) ‘Orange banana to boost kids’ eyes’, *New Scientist*, www.newscientist.com/article/dn6120-orange-banana-to-boost-kids-eyes.html, accessed January 20, 2011.
- Coyne, T. (2000) ‘Lifestyle diseases in Pacific communities’, Noumea, New Caledonia, Secretariat of the Pacific Community.
- Coyne, T., Ibiebele, T.I., Baade, P.D., Dobson, A., McClintock, C., Dunn, S., Leonard, D. and Shaw, J. (2005) ‘Diabetes mellitus and serum carotenoids: findings of a population-based study in Queensland, Australia’, *American Journal of Clinical Nutrition*, vol 82, pp.685–693.

- Davey, M.W., Van den Bergh, I., Markham, R., Swennen, R., Keulemans, J. (2009) 'Genetic variability in Musa fruit provitamin A carotenoids, lutein and mineral micronutrient contents', *Food Chemistry*, vol 115, pp.806–813.
- David, J.P. (2005) Proclamation of World Food Day 2005: Karat as the Pohnpei State Banana. Office of the Governor, Pohnpei State Government, Kolonia, Pohnpei.
- Dignan, C., Burlingame, B., Kumar, S., and Aalbersberg, W. (2004) *The Pacific Islands Food Composition Tables*, 2nd edn, Food and Agriculture Organization of the United Nations, Rome.
- Englberger, L. (2001) 'Varieties of bananas and taro in Micronesia are found high in provitamin A carotenoids', *Proceedings of the First South East Asia and Pacific Regional Meeting on Carotenoids*, 2–5 August 2000, Bangkok, Thailand, Institute of Nutrition, Mahidol University in collaboration with the International Carotenoid Society, supported by the FAO Regional Office for Asia and the Pacific, pp.27–33.
- Englberger, L. (2006) 'Going Yellow video promotes healthy food in Micronesia', *Sight and Life Newsletter* 1/2006, pp.31–33.
- Englberger, L. (2011) *Let's Go Local. Guidelines for Promoting Pacific Island Food*, FAO, Rome, Italy. <http://www.fao.org/docrep/015/an763e/an763e.pdf>
- Englberger, L., Aalbersberg, W., Ravi, P., Bonnin, E., Marks, G.C., Fitzgerald, M.H., and Elymore, J. (2003a) 'Further analyses on Micronesian banana, taro, breadfruit and other foods for provitamin A carotenoids and minerals', *Journal of Food Composition and Analysis*, vol 16, no 2, pp.219–236.
- Englberger, L., Aalbersberg, W., Fitzgerald, M.H., Marks, G.C., and Chand, K. (2003b) 'Provitamin A carotenoid content of different cultivars of edible pandanus fruit tectorius', *Journal of Food Composition and Analysis*, vol 16, no 2, pp.237–247.
- Englberger, L., Schierle, J., Marks, G.C., and Fitzgerald, M.H. (2003c) 'Micronesian banana, taro, and other foods: newly recognized sources of provitamin A and other carotenoids', *Journal of Food Composition and Analysis*, vol 16, no 1, pp.3–19.
- Englberger, L., Marks, G.C., and Fitzgerald, M.H. (2003d) 'Insights on food and nutrition in the Federated States of Micronesia: a review of the literature', *Public Health Nutrition*, vol 6, no 1, pp.3–15.
- Englberger, L., Schierle, J., Aalbersberg, W., Hofmann, P., Humphries, J., Huang, A., Lorens, A., Levendusky, A., Daniells, J., Marks, G.C., and Fitzgerald, M.H. (2006) 'Carotenoid and vitamin content of Karat and other Micronesian banana cultivars', *International Journal of Food Science and Nutrition*, vol 57, pp.399–418.
- Englberger, L., Schierle, J., Kraemer, K., Aalbersberg, W., Dolodolotawake, U., Humphries, J., Graham, R., Reid, A.P., Lorens, A., Albert, K., Levendusky, A., Johnson, E., Paul, Y., and Sengebau, F. (2008) 'Carotenoid and mineral content of Micronesian giant swamp taro (*Cyrtosperma*) cultivars', *Journal of Food Composition and Analysis*, vol 21, pp.93–106.
- Englberger, L., Schierle, J., Hoffman, P., Lorens, A., Albert, K., Levendusky, A., Paul, Y., Lickaneth, E., Elymore, A., Maddison, M., deBrum, I., Nemra, J., Alfred, J., Vander Velde, N., and Kraemer, K. (2009a) 'Carotenoid and vitamin content of Micronesian atoll foods: pandanus (*Pandanus tectorius*) and garlic pear (*Crataeva speciosa*) fruit', *Journal of Food Composition and Analysis*, vol 22, no 1, pp.1–8.
- Englberger, L., Lorens, A., Levendusky, A., Pedrus, P., Albert, K., Hagilmai, W., Paul, Y., Nelber, D., Moses, P., Shaeffer, S., and Gallen, M. (2009b) 'Chapter 6: Documentation of the Traditional Food System of Pohnpei', pp.109–138. in: H.V. Kuhnlein, B. Erasmus and D. Spigelski (eds) *Indigenous Peoples' Food Systems: the Many Dimensions of Culture, Diversity and Environment for Nutrition and Health*, FAO, Rome.

- Englberger, L., Kuhnlein, H.V., Lorens, A., Pedrus, P., Albert, K., Currie, J., Pretrick, M., Jim, R., and Kaufer, L. (2010a) 'Pohnpei, FSM case study in a global health project documents its local food resources and successfully promotes local food for health', *Pacific Health Dialog*, vol 16, no1, pp.121–128.
- Englberger, L., Lorens, A., Pretrick, M., Spegal, R., and Falcam, I. (2010b) '“Go Local” Island Food Network: Using email networking to promote island foods for their health, biodiversity, and other “CHEEF” benefits', *Pacific Health Dialog*, vol 16, no 1, pp.41–47.
- Englberger, L., Joakim, A., Larsen, K., Lorens, A., and Yamada, L. (2010c) 'Go local in Micronesia: Promoting the “CHEEF” benefits of local foods', *Sight and Life Magazine* 1/2010, pp.40–44.
- Englberger, L., Lorens, A., Pretrick, M., Raynor, B., Currie, J., Corsi, A., Kaufer, L., Naik, R.I., Spegal, R., and Kuhnlein, H.V. (2010d) Chapter 13: Approaches and Lessons Learned for Promoting Dietary Improvement in Pohnpei, Micronesia, in: B. Thompson and L. Amoroso (eds) *Combating Micronutrient Deficiencies: Food-based Approaches*, Food and Agriculture Organization of the United Nations.
- FAO (2004) 'What is Agrobiodiversity Factsheet' developed from the Training Manual Building on Gender, Agrobiodiversity and Local Knowledge, Food and Agriculture Organization.
- FSM Department of Economic Affairs (2002) *2000 Population and housing census report: National census report, Palikir*, Pohnpei, FSM National Government.
- Fungo, R., Kikafunda, J.K., and Pillay, M. (2010) 'Beta-carotene, iron and zinc content in Papua New Guinea and East African Highland Bananas', *African Journal of Food, Agriculture and Nutrition Development*, vol 10, no 6, www.ajfand.net/Issue36/PDFs/Fungo5060.pdf, accessed February 1, 2010.
- Hanson, M. (2010) 'New FSM Postal Stamps Promote Local Foods', *Kaselehlie Press*, vol 10, no 21, p.15.
- Hezel, F.X. (2010) 'Disease in Micronesia: A historical survey', *Pacific Health Dialog*, vol 16, no 1, pp.11–25.
- IFCP (2004) Articles of Incorporation of the Island Food Community of Pohnpei (IFCP), Pohnpei, Federated States of Micronesia.
- IFCP and Micronesian Seminar (2006), *Going Yellow* (video), Kolonia, Pohnpei, FSM.
- Johnson, E. (2010) 'Yap community of Ruu holds Go Local workshop', *Kaselehlie Press*, vol 10, no 15, p.15.
- Johnson, E. (2011) 'Let's Go Local Spurs up Action at the Calvary Christian Academy', *Kaselehlie Press*, vol 11, no 9.
- Kaufer, L., Englberger, L., Cue, R., Lorens, A., Albert, K., Pedrus, P., and Kuhnlein, H.V. (2010) 'Evaluation of a traditional food for health intervention in Pohnpei, Federated States of Micronesia', *Pacific Health Dialog*, vol 16, no 1, pp.61–73.
- Kritchevsky, S.B. (1999) 'Beta-carotene, carotenoids and the prevention of coronary heart disease', *Journal of Nutrition*, vol 129, pp.5–8.
- Kuhnlein, H.V. (2004) 'Karat, pulque and gac: three shining stars in the traditional food galaxy', *Nutrition Reviews*, vol 62, pp.439–442.
- Kuhnlein, H.V., Smitasiri, S., Yesudas, S., Bhattacharjee, L., Li Dan, Ahmed, S. and collaborators (2006) *Documenting Traditional Food Systems for Indigenous Peoples: International Studies*. Guidelines for Procedures. Centre for Indigenous Peoples' Nutrition and Environment, McGill University, Canada <http://www.mcgill.ca/cinc/research/global/> (accessed 29 October 2012)
- McLaren, D.S., and Frigg, M. (2001) *Sight and Life Manual on Vitamin A Deficiency Disorders (VADD)*, 2nd edn, Basel, Task Force Sight and Life.

- Mori, M. (2010) Proclamation to encourage awareness on food security issue in the Federated States of Micronesia. Office of the President, Pohnpei, Federated States of Micronesia.
- Naik, R.I. (2008) An Assessment of Local Food Production in Pohnpei, Federated States of Micronesia. B.S. Thesis, University of California, Santa Barbara.
- Newilah, G.N., Lusty, C., Van den Bergh, I., Akyeampong, E., Davey, M., and Tomekpe, K. (2008) 'Evaluating bananas and plantains grown in Cameroon as a potential source of carotenoids', *Food*, vol 2, no 2, pp.135–138.
- Ormerod, A. (2006) 'The case of the yellow bananas', *Eden Project Friends*, vol 23, pp.6–7.
- Pacific Food Summit (2010) Framework for Action on Food Security in the Pacific, A framework agreed by participants at the Pacific Food Summit, April 21–23, 2010, www.foodsecurepacific.org, accessed February 2011.
- Parvanta, A., Englberger, L., Lorens, A., and Yamada, L. (2006) *Report on a Banana Volume Market Study and Health/Awareness Campaign*, Island Food Community of Pohnpei, Kolonia, Pohnpei.
- Raynor, B. (1991) 'Agroforestry Systems in Pohnpei – Practices and Strategies for Development: RAS/86/036 Field Document 4', FAO/UNDP South Pacific Forestry Development Programme.
- SPC LRD News (2008) 'Go Local: Working to improve the nutritional security of Solomon Islands and PNG local communities', Secretariat of the Pacific Community (SPC) Land Resources Division (LRD), *News*, vol 4, no 3, p.22.
- Suda, E., Ragus, L., and Englberger, L. (2010) 'Go Local Project is Initiated in Chuuk as a Collaborative Effort', *Kaselehlie Press*, vol 10, no 14, p.15.
- Tara, M. (2010) 'Kosrae holds Go Local agroforestry and health workshop', *Kaselehlie Press*, March 31, vol 10, no 9, p.15.
- World Cancer Research Fund (WCRF)/American Institute for Cancer Research (AICR) (2007) *Food, Nutrition, Physical Activity and the Prevention of Cancer: A Global Perspective*, AICR, Washington DC.
- WHO (2008) 'Federated States of Micronesia (Pohnpei) NCD risk factors STEPS report', Suva, WHO Western Pacific Region.
- WHO (2009a) 'Global prevalence of vitamin A deficiency in populations at risk 1995–2005. WHO Global Database on Vitamin A Deficiency', Geneva, World Health Organization, whqlibdoc.who.int/publications/2009/9789241598019_eng.pdf, accessed January 31, 2011.
- WHO (2009b) 'Nutrition, Diet and Lifestyle: Scaling up action in the Pacific', Summary report of regional meeting, Tanoa International Hotel, Nadi, Fiji, 23–27 February 2009.
- Yamamura, C., Sullivan, K.M., van der Haar, F., Auerbach, S.B. and Iohp, K.K. (2004) 'Risk factors for vitamin A deficiency among preschool aged children in Pohnpei, Federated States of Micronesia', *Journal of Tropical Pediatrics*, vol 50, no 1, pp.16–19.