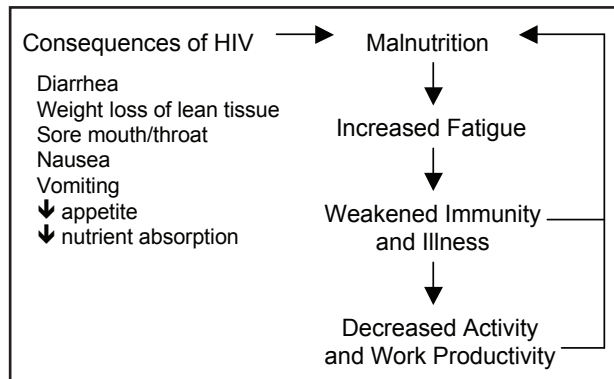


**INCREASING ANIMAL SOURCE FOODS IN DIETS OF HIV-INFECTED KENYAN
WOMEN AND THEIR CHILDREN (HIV NUTRITION PROJECT)
(HNP)**

PROJECT DESCRIPTION

The GL-CRSP HIV Nutrition Project (HNP) is researching the effect of protein quality and micronutrients in meat on the health and nutritional well-being of women living with HIV and the growth, health and cognitive development of their vulnerable children in the Turbo Division of Uasin Gishu District in Kenya. By means of a randomized nutrition feeding intervention, powdered dried beef will be added as an ingredient to a standard biscuit recipe to enhance the protein quality and trace element bioavailability of diets. Outcomes will be compared with those of like subjects who receive supplements with the same amount of energy, but with either soya or wheat protein. The study will show if meat in the diets of HIV-infected women and their children (1) protects the immune system and prevents severe infection, (2) prevents the loss of lean body mass, enhancing the quality of life and enabling women to carry out their activities of daily living, and/or (3) supports the growth and development of their vulnerable children. The intervention food with beef protein provides significantly more vitamin B12, lysine and bio-available iron, zinc and selenium when compared to the soya and wheat supplements. Deficiencies of these nutrients may hasten HIV disease progression.



HIV's effects on body composition and quality of life.

PRINCIPAL INVESTIGATORS

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SUMMARY OF ACHIEVEMENTS

- The Kenyan Co-Principal Investigators and senior HNP field staff worked with local community leaders to create awareness of the research project and to recruit study participants. Thirty-one women participated in the Phase I Food Security Assessment, eighteen women and nineteen children were enrolled in the Phase II Preliminary Trial, and 88 families have been identified for the main nutrition intervention study thus far.



Anthropometry enumerator obtaining hand grip strength measures from a mother in the Phase II pilot. Photo by Vickie Chepkemoi Koske.

- Preliminary results of the HNP Food Security Assessment of 31 HIV-infected Kenyan women and their children indicated that about half of the households had no source of income and relied on self-sustenance or good will for food. The majority could not afford three meals per day and consumed monotonous diets with little animal source foods. Over 75% reported no intakes of egg, meat or fish within the past 24 hours.
- Nine, primarily female, field assistants were hired and trained in nutrition and cognitive assessment techniques in order to obtain quality data in determining the impact of the nutrition intervention in the field trial.
- HNP field staff members involved in data collection received specific trainings in anthropometry, hand grip and pinch dynamometry, administration of the bioelectrical impedance analysis, nutrient intake, socioeconomic and food security assessments, morbidity training, and cognitive development assessments with the Bayley Developmental tool that has been adapted for Kenyan infants and young children.

HNP Non-Degree Training for 2006-2007			
Country	Male	Female	Total
Kenya	2	52	54
United States	0	1	1
Total	2	53	55

- Moi University administration at the Chepkoilel campus agreed to provide the space and to upgrade the production kitchen to accommodate food production appliances that are provided from the HNP GL-CRSP budget and will be used in the nutrition intervention production.
- A meat, soya or wheat porridge was created from all three types of biscuits. It was well-tolerated by infants and toddlers less than two years of age. Boiled and filtered water was added to the biscuit to make a porridge consistency.
- The already existing partnership between Moi University and Indiana University expanded beyond the Schools of Medicine and the Academic Model for the Prevention and Treatment of HIV (AMPATH) to now include the School of Public Health (Moi University), the School of Health and Rehabilitation

HNP Degree Training for 2006-2007					
Name (Last, First)	Nationality	Gender (M/F)	University	Discipline	Degree
Korir, Salome	Kenyan	F	University of Nairobi	Nutrition	PhD

Sciences (Indiana University), and the Schools of Medicine and Public Health (UCLA).

- Population Services International (PSI) is supplying treated bed nets at a subsidized rate of approximately one third of the commercial cost. Nets have already been distributed to Phase II participants and will be distributed to Phase III households at enrollment.
- Heifer International will be supplying purebred dairy goats and animal husbandry training to the HNP participants upon the completion of the 12-month intervention. Heifer field staff will undergo the AMPATH HIV training before meeting the study participants.
- Because it is important to the outcome of the HNP intervention study that contaminated household water does not contribute to health problems in participants, it was decided that

household water supplies will be screened, boiled and filtered. This action will convey the importance of safe drinking water on the health of project participants and their households.

- Due to sensitive issues surrounding HIV positive women in Kenya, stigma continues to be a significant roadblock for many women to learn their status. Through suggesting that animal source foods may benefit those at earlier stages of HIV infection, the HNP project is motivating individuals to become informed of their status.
- Because most of the hired field staff is from the local community and understands the local languages and customs, they are able to communicate effectively with study participants. This is a great strength for effective implementation and continued success of the HNP study.



The food production team (Angela, Viola and Dorcas) putting nutrition intervention biscuits into the preheated oven to bake. Photo by Joseph Kariuki.

RESEARCH BRIEFS

GL-CRSP Research Brief 08-01-HNP: Introduction to the HIV Nutrition Project (HNP): Increasing Animal Source Foods (ASF) in Diets of HIV-infected Kenyan Women and Their Children

Authors: Judith Ernst, Indiana University; Grace Ettyang, Moi University; Charlotte Neumann, UCLA; Winstone Nyandiko, Abraham Siika, Moi University; Constantin Yiannoutsos, Indiana University

Summary. Many of the estimated 28 million people with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) living in Sub-Saharan Africa also suffer from malnutrition. Reproductive-age women, their infants and young children are among the most vulnerable for malnutrition and progression of HIV to AIDS. As seen in eastern and southern Africa, mortality is increased in the malnourished. The HIV Nutrition Project (HNP) research will be evaluating the effect of protein quality and micronutrients in meat on the health and nutritional well-being of women living with HIV in rural Kenya and the health and development of their children by means of a randomized nutrition feeding intervention. It will be determined if meat in the diets of HIV-infected women and their children (1) protects the immune system and prevents severe infection; (2) prevents the loss of lean body mass, enhancing the quality of life among these drug naïve women and enabling them to carry out their daily activities; and (3) supports the growth and development of their vulnerable children when compared to those given supplements with the same amount of energy, but with either soya or wheat protein. The intervention food with beef protein provides significantly more vitamin B12, lysine and bio-available iron, zinc and selenium when compared to the soya and wheat supplements. Deficiencies of these nutrients may hasten HIV disease progression.

HNP Funding for 2006-2007	
Total Core Funding	\$ 251,720
Total Cost Share	\$ 40,636
Leveraged Funding	\$ 10,000

GL-CRSP Research Brief 08-02-HNP: HIV Infection and Nutrition Status: The Importance of Food in Disease Management

Authors: Judith Ernst, Indiana University; Grace Ettyang, Moi University; Charlotte Neumann, UCLA; Winstone Nyandiko and Abraham Siika, Moi University

Summary. Preliminary evidence suggests that improved nutrition early in human immunodeficiency virus (HIV) infection may delay progression to acquired immunodeficiency syndrome (AIDS) and delay the initiation or improve the effectiveness of antiretroviral drug therapy (ART). The scientific community has evolved in its appreciation of the value of food as an integral component of comprehensive care for individuals with HIV infection and AIDS. It is now well recognized that those who are food insecure and malnourished are more likely to fail drug treatment regimens. A body mass index (BMI) less than 18 at the initiation of ART is strongly predictive of death. In addition, weight loss during the first four weeks of ART is also associated with death and a higher BMI is protective and is associated with better responses with ART. Patient response to nutrition intervention, however, may be confounded by the stage of HIV progression and other infections. That is, those who are in the earlier stages of the disease may respond better to aggressive nutrition intervention. The HIV Nutrition Project (HNP) “Increasing Animal Source Foods in Diets of HIV-infected Kenyan Women and Their Children” will evaluate the effect of protein quality and micronutrients in meat on the health and nutritional well-being of women living with HIV in rural Kenya and the health and development of their children by means of a randomized nutrition feeding intervention. Researchers will study if the inclusion of meat added as an ingredient to a biscuit, when compared to soy or wheat, will best protect the immune system and prevent severe infection, prevent the loss of body mass and enhance the quality of life. These women are not yet receiving antiretroviral

drugs and therefore are not yet experiencing metabolic inefficiencies associated with AIDS.

GL-CRSP Research Brief 08-03-HNP: The Academic Model for the Prevention and Treatment of HIV (AMPATH) in Kenya

Authors: Winstone Nyandiko, Abraham Siika, Moi University; Judith Ernst, Indiana University; Grace Ettyang, Moi University, Charlotte Neumann, UCLA; Constantin Yiannoutsos, Indiana University

Summary. In 2001, Moi University in Eldoret, Kenya joined with Kenya's second national referral hospital, Moi Teaching and Referral Hospital (MTRH) and Indiana University (IU) to establish the Academic Model for the Prevention and Treatment of HIV (AMPATH). AMPATH's missions were to (1) provide high-quality patient care; (2) educate patients and health care providers; and (3) establish a laboratory for clinical research in HIV/AIDS. Leveraging the power of our academic medical partnership, AMPATH has quickly become one of the largest and most comprehensive HIV/AIDS control systems in Sub-Saharan Africa, providing a system of care that has been described as a model of sustainable development. Delivery of services occurs in the public sector through hospitals and health centers run by Kenya's Ministry of Health. AMPATH currently implements prevention activities that touch the lives of millions of persons in a wide geographic area. The research arm of AMPATH, created to facilitate and manage the international research agenda being generated by Kenyan and US faculty, includes the GL-CRSP HIV Nutrition Project (HNP) "Increasing Animal Source Foods in Diets of HIV-infected Kenyan Women and Their Children," which is a collaborative initiative between AMPATH and faculty from Moi University, Indiana University and the University of California, Los Angeles.

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COLLABORATING INSTITUTIONS

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Heifer International, Kenya
Moi University, Kenya
Population Services International, Kenya
University of California, Los Angeles