Australian Government

Australian Centre for International Agricultural Research

THE UNIVERSITY OF SYDNEY

Options for achieving optimal diets in resource-limiting settings

Follow the discussion at:
http://www.anh-academy.org/options-achieving-optimal-diets-resource-limiting-settings

CGIAR | Research Program on Nutrition and Health

Agriculture, Nutrition and Health Academy
Plenary Workshop, Addis Ababa, 21 June 2016

RVC Royal Veterinary College University of London

Our challenge

How do we deliver **nutritionally optimal**, **ethical**, **appropriate**, **safe and** **sustainable diets** in resource-limiting settings?

Outline

1. **Introduction** (Robyn Alders, USyd)
   - characteristics of resource-limiting settings and maternal and child nutrition
   - understanding options for and promoting dietary diversity in resource-limiting settings
2. **Animal-source food and maternal and child nutrition in resource-limiting settings** (Paula Dominguez-Salas and Julia de Bruyn)
3. **Village poultry, gender and maternal and child nutrition: findings and lessons from central Tanzania** (Julia de Bruyn)
4. **Dietary adequacy in resource-limiting areas of Nairobi** and **food safety aspects of ASF** (Delia Grace and Paula Dominguez-Salas)
5. **Approaches for assessing diets in resource-limiting settings** (Mieghan Bruce)
6. **Interactive session**
7. **Wrap up and finalising workshop statement**

My dual passions, commitment to family farming and a possible conflict of interest

Village chickens and their owners

Merino sheep and Australian farmers

1. **Introduction**

and

Understanding options for and promoting dietary diversity in resource-limiting settings

Resource-limiting settings

Geographical
- low rainfall areas
- inhospitable climate
- poor soil

Socio-economic
- low income
- inadequate access

Household
- inadequate access to information
- inadequate access to resources/assets
- inadequate decision-making power

Temporal
- low rainfall seasons
- natural disasters

Challenges for women in resource-limiting settings

Nutritional information for breastfeeding women

Tanzanian Food and Nutrition Centre, 2014

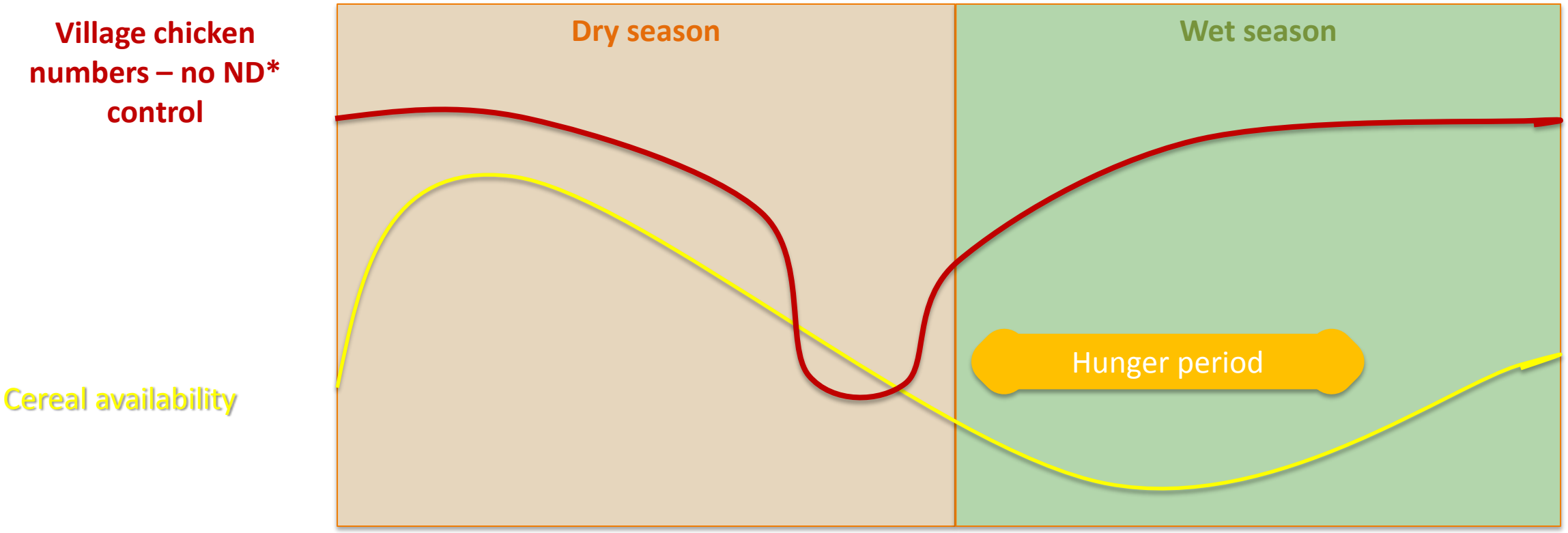
Environment where breastfeeding women live

Alders, 2014

Alders, 2014

Providing nutritious food across the seasons in agriculturally resource-limiting situations

Providing nutritious food across the seasons in agriculturally resource-limiting situations



* ND = Newcastle disease

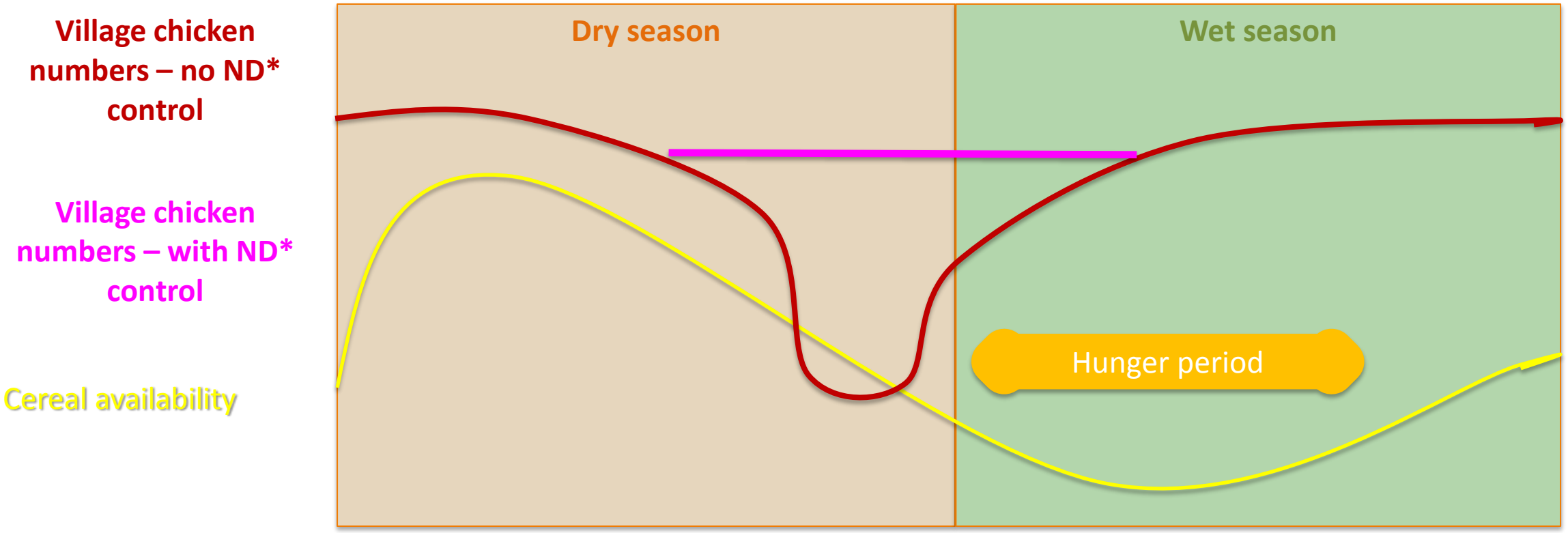
In utero dietary requirements

Trimester	Nutrient requirements		
	Protein	Micronutrients	Energy
First	+++	+++	+
Second	++	++	++
Third	+	+	+++

Women reluctant to disclose pregnancy during first trimester
Therefore: crucial to ensure good nutrition for women of reproductive age

(Kimboka 2014)

Providing nutritious food across the seasons in agriculturally resource-limiting situations



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Family poultry: three production systems under one umbrella

Family poultry is defined as **small-scale** poultry keeping by households using family labour and, wherever possible, locally available feed resources.

Family poultry employs one of three different production systems and may involve chickens, muscovy, pigeons, mallard ducks, Guinea fowl, quail, turkeys or geese.

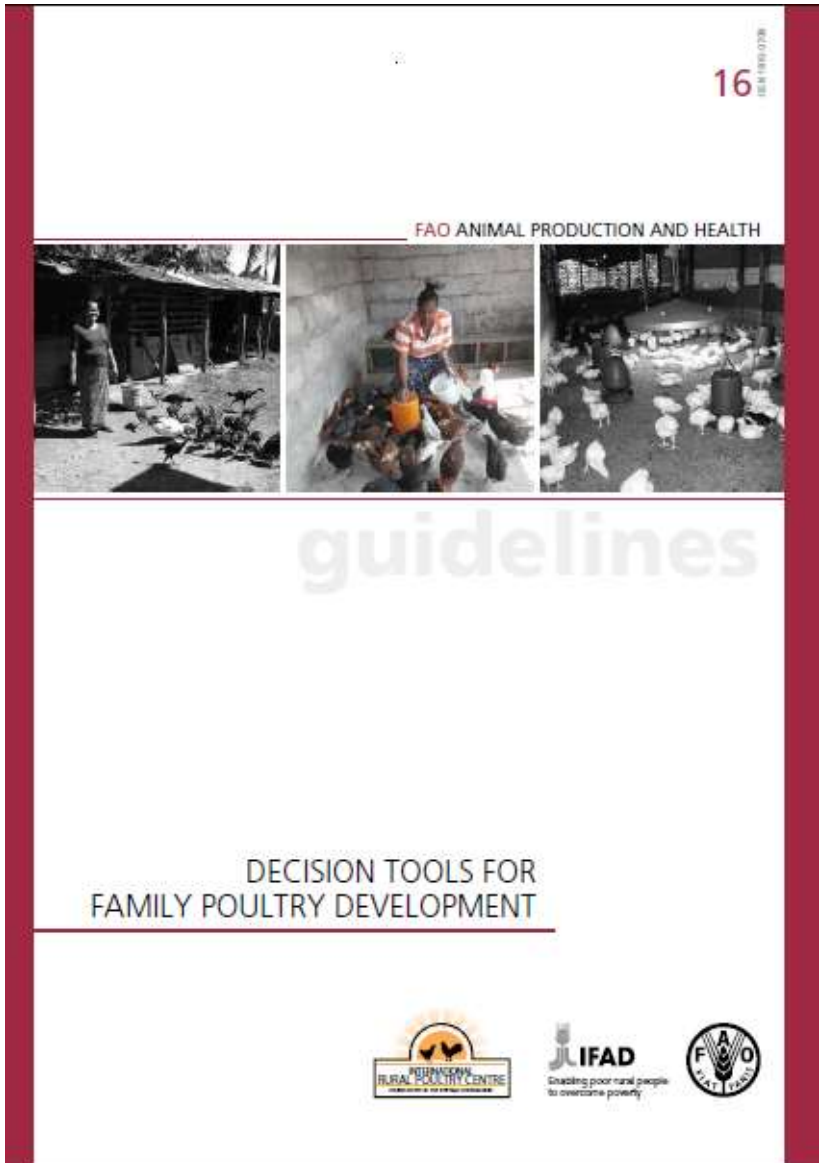
Increasing inputs

Credit: Kyeema/Alders

Decision tools for family poultry development

- **Chapter 1: Defining family poultry production systems and their contribution to livelihoods**

- Available: http://www.fao.org/3/a-i3542e.pdf



Strengthening food and nutrition security through family poultry and crop integration in Tanzania and Zambia (Nkuku4U; FSC/2012/023)

Research aim

To **reduce childhood undernutrition** by analysing and testing opportunities to enhance the key role that **women** play in improving **poultry and crop integration and efficiency to strengthen household nutrition**.

Our Project Team

Tanzania

Tanzania Veterinary Laboratory Agency
Tanzania Food and Nutrition Centre
Ministry of Agriculture, Food Security and Cooperatives
Sokoine University of Agriculture
Dar es Salaam University
Muhumbili University of Health and Allied Sciences

Zambia

Ministry of Fisheries and Livestock
Ministry of Health (Public Health)
Ministry of Community Development and Social Welfare
National Commission for Food and Nutrition
University of Zambia

Australia

USyd School of Public Health
- Nutritional Epidemiologist
- Biostatistician

USyd Faculty of Agriculture and Environment
- Post Harvest Specialist and Farming Systems

USyd Faculty of Veterinary Science
- Vet Public Health Epidemiologist; Biometrician
- Village Poultry Health and Food and Nutrition Security Specialist

International

Royal Veterinary College, London
- One Health Economist
- Veterinary Ecologist

Kyeema Foundation
- Social Anthropologist
- Veterinary Laboratory and Cold Chain Specialist

Further details

http://sydney.edu.au/vetscience/research/Nkuku4U/

Project objectives

1. To assess the existing family poultry-crop **systems** and poultry **value chains.**
2. To **test appropriate interventions** for improving the integration and efficiency of family poultry/crop systems and poultry value chains.
3. To **assess the role of women and impact of improved family poultry-crop systems interventions** on childhood undernutrition.
4. To **support capacity building of and catalyse strategic long-term partnerships** between key institutions and individuals associated with family poultry, food security, and sustainable agriculture.

Nkuku4U Dietary Diversity Tool

- Based on questionnaires used previously in Tanzania

Green leafy vegetables	Cassava leaves ..... 1 Bean leaves ..... 2 Amaranthus ..... 3 Pumpkin leaves ..... 4 Spinach ..... 5 Other (specify) ..... 96 [ ] None 99
Other vegetables	Pumpkin ..... 1 Okra ..... 2 Eggplant ..... 3 Carrots..... 4 Other (specify) ..... 96 [ ] None..... 99
Meat, fish and offal	Cow ..... 1 Goat ..... 2 Pig ..... 3 Chicken ..... 4 Duck ..... 5 Guinea fowl ..... 6 Liver ..... 7 Fish ..... 8 Other (specify) ..... 96 [ ] None..... 99

Source: Excerpts from Maternal and Child Health and Nutrition Baseline Questionnaire


Initial dietary diversity tool used was not well-adapted to local conditions
Missed many non-cultivated foods of plant and animal origin
Credit: Robyn Alders, USyd

Nutrition sensitive landscape

A Nutrition Sensitive Landscapes (NSL) approach considers:

- the diverse interactions and interconnectivity within a given landscape
- to optimize the multiple goals of food and nutrition security, sustainable use of natural resources and
- conservation of biodiversity, both for human health, as well as environmental health.

Source: http://www.bioversityinternational.org/fileadmin/user_upload/research/research_portfolio/Diet_diversity/Nutrition__Sensitive_Landscapes_Concept_paper_March_2014.pdf

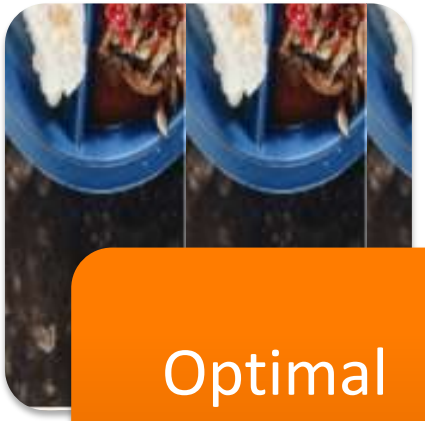
Credit: Brigitte Bagnol

Our current model

Secondary data

Biodiversity

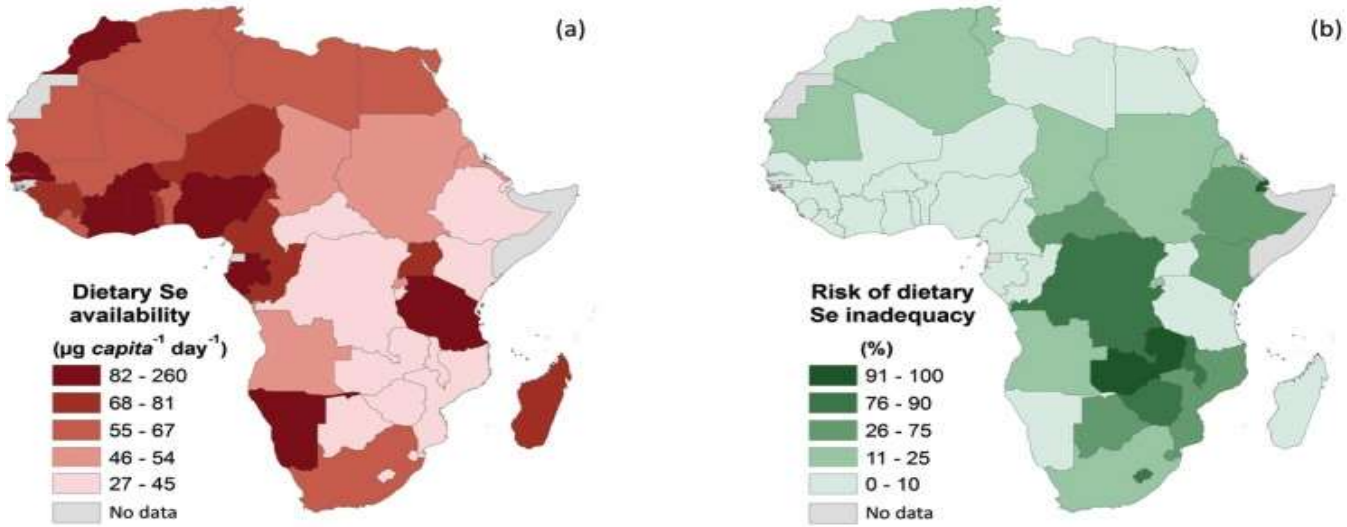
Dietary diversity



Optimal dietary options

Secondary data analysis

- Agro-ecological data (soil analysis, rainfall, etc.)
- Socio-economic data (main production and trade, constraints, etc.)
- Gender issues (Access, control and benefits over resources, etc.)
- Linguistic group specificities
- Health and nutrition data (malnutrition, fertility rate, age at first birth, etc.)
- List of principal stakeholders



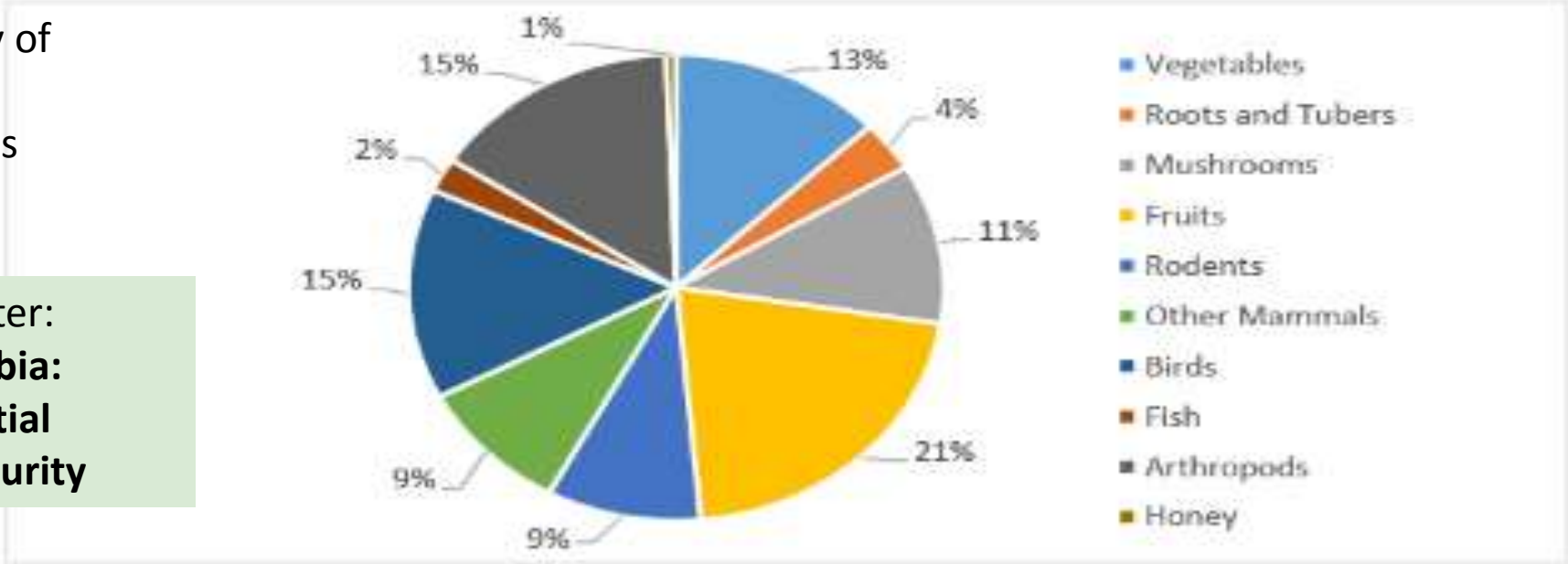
Mapping dietary Selenium availability in Africa

Source: http://www.nature.com/articles/srep01425?message-global=remove

Inventory of non-cultivated food

Objectives	Tools and instruments
Identify the different seasons	Focus group discussion (FGD)
List non-domesticated and domesticated animals for each season	FGD and key informants (KI): Check lists
List non-cultivated and cultivated plants and fruits for each season	FGD and KI: Check lists

Example of possible results: Frequency of non-cultivated food item reported in Bundabunda Ward for all three seasons



Further details in ANH conference poster:
Wild foods in Bundabunda Ward Zambia: An assessment of diversity and potential contribution to food and nutrition security

Source: Ursula Huber, Royal Veterinary College

Dietary diversity

Objectives	Tools and instruments
• Assess household Dietary Diversity • Evaluate relative proportion of cultivated and non cultivated food by gender, age and reproductive status	Questionnaire: 24 hour recall (adapted from Kennedy, Ballard and Dop. 2013)
Evaluate the quantity of each food in a daily diet	Focus Group Discussion

Example: Dietary diversity registered in Bundabunda Ward at the end of the dry season in 2015

≤ 3 food groups	4 and 5 food groups	≥ 6 food groups
26%	52%	22%

Source: Elasto Zulu
University of Zambia

Optimal dietary options

Objectives	Tools and instruments
Assess quantity of food consumed by age, gender and reproductive stage	Weighing of food consumed
Identify food composition	Food composition data (participatory expert consultation for estimate composition when necessary)
Develop culturally acceptable diet by age, gender and reproductive stage per each season	Preparation with communities members of some suggested combination of food and test for palatability and acceptability

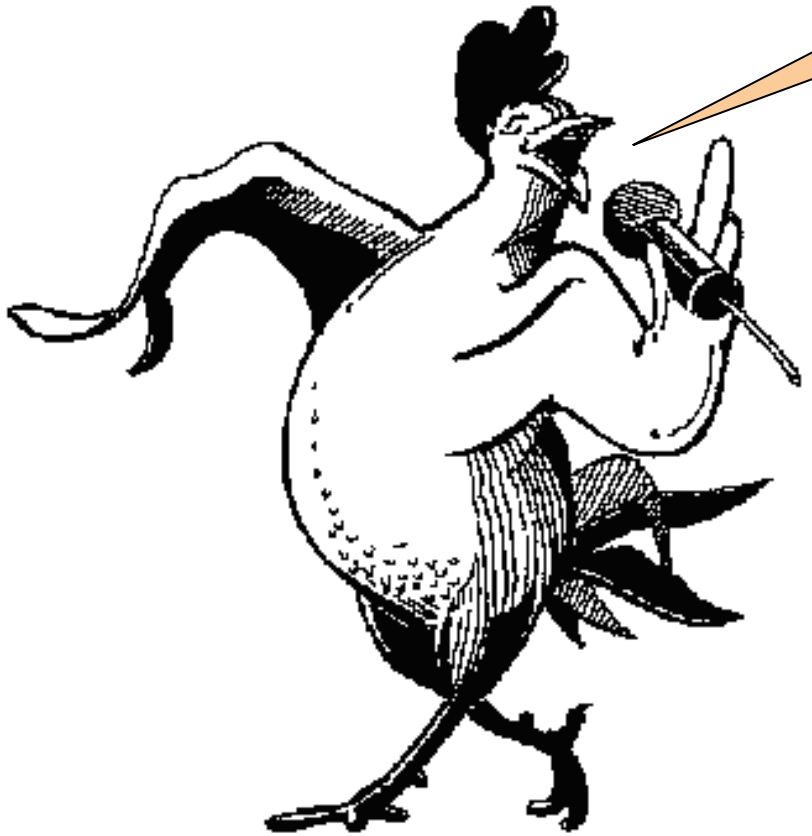
Further details in ANH conference poster:
Nutrition knowledge, attitudes and dietary intake of women of reproductive age in Bundabunda Ward, Zambia

Credit: Allison Grech, University of Sydney

Examples of tools used

Objectives	Tools and instruments
Quantify food consumed	Different spoon size
Open up discussion around non-cultivated food	Laminated images of cultivated and non-cultivated food available during the season

6. Interactive session



Discussion themes

- Dietary adequacy in urban and peri-urban environments
- Dietary adequacy in rural environments
- Resource-limited household members / Resource allocation within households
- Dietary diversity, biodiversity and sustainable diets

Discussion questions

- What are examples of projects/programs currently working in on these themes?
- What lessons have we learnt from research in these themes to date?
- Can you provide examples of how gender has been successfully integrated as a cross-cutting theme?
- Can you provide examples of how food safety has been successfully integrated as a cross-cutting theme?
- What methods have you used to identify linkages / pathways / systems in these settings?

Moving forward

- Resource-limited research
  - Time to understand research setting (ecological, social, economic)
  - Willingness to share limitations and challenges faced

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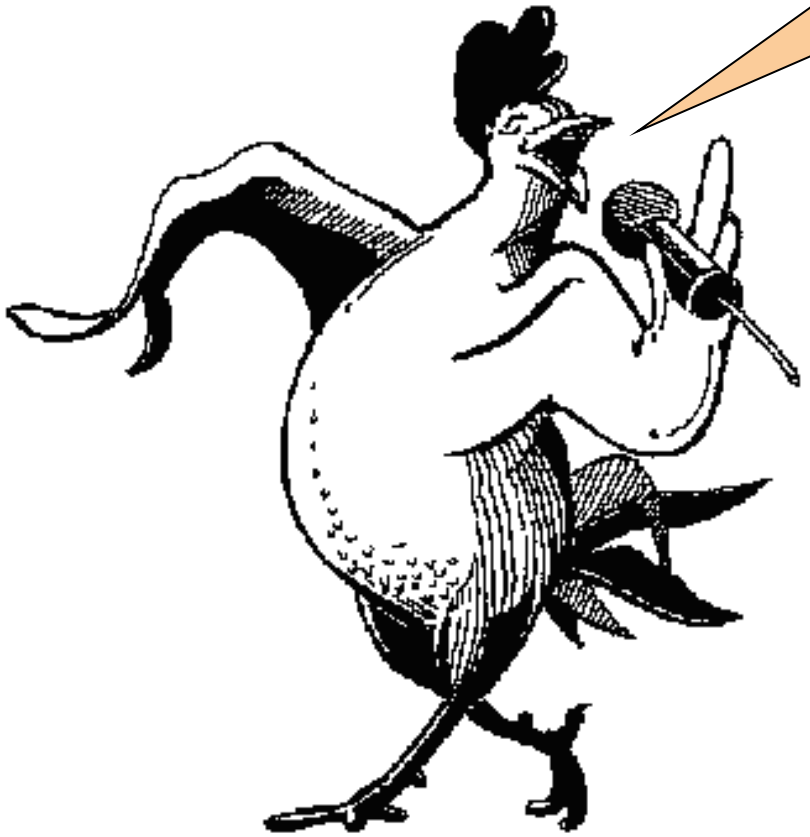
7. **Wrap up** and **finalising workshop statement**



Draft workshop statement

Available: http://www.anh-academy.org/options-achieving-optimal-diets-resource-limiting-settings

"There is **no single, perfect diet that fits everyone** but rather **a range of dietary options** depending on locally available food, biological (age, gender, health and reproductive status) and socio-cultural factors.

In many resource-limiting environments, food availability is influenced by seasonal farming and production patterns, livestock and land ownership, non-cultivated plants and non-domesticated animals, socioeconomic circumstances, tradition and the presence of markets for affordable food. In terms of efficiency, the bioavailability and density of key macro- and micro-nutrients vary across different foods, by season and with processing, and trade-offs and synergies between nutritional security, food safety, livelihoods, women's empowerment and ecosystem services should be considered. Animal-source foods, even in small quantities, offer the particular advantage of increasing the adequacy of plant-based diets.

Strong and functional linkages between nutritional programs, nutrition-sensitive agriculture and value-chains at local and national levels, with a strong focus on sustainable systems, process and policy, can contribute to **nutritionally optimal, safe, appropriate, sustainable and ethical diets in resource-limiting settings**.

To support optimal use of limited research resources, the **open sharing of de-identifed data bases** together with information on **data collection protocols**, **assumptions employed** and **strengths and weakness of data bases** is recommended."

One Health EcoHealth 2016

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www.oheh2016.org

Congress Hosts:

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THE UNIVERSITY OF SYDNEY

Pre-congress workshop:

Secure, safe, sustainable food systems: Safe today, optimal for the future

30 Nov- 2 Dec 2016

http://oheh2016.org/pre-congress-workshops/

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ACIAR veterinary cold chain manual

Animal-source food (ASF) consumption across Africa remains low; improved animal health can help to increase access to safe, affordable ASF

Reliable cold chains are essential to ensure effective vaccination

Has received significant attention by our human medicine colleagues

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http://aciar.gov.au/publication/mn165a

VETERINARY COLD CHAIN MANUAL
Ensuring effective vaccines

Thank you for your attention

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Comments?