

PART 3: TRAINER'S GUIDE

The trainer's guide is the third of four parts contained in this module. It is NOT a training course. This guide provides guidance on how to design a training course by giving tips and examples of tools that the trainer can use and adapt to meet training needs. The trainer's guide should only be used by experienced trainers to help develop a training course that meets the needs of a specific audience. The trainer's guide is linked to the technical information found in Part 2 of the module.

Module 14 is about the prevention and treatment of micronutrient malnutrition. It aims to help participants learn about a range of approaches that can be used for tackling these important public health problems.

Participants need to have an understanding of micronutrient malnutrition and have completed Module 4 before beginning this module.

Navigating your way around the guide

The trainer's guide is divided into six sections.

1. **Tips for trainers** provide pointers on how to prepare for and organize a training course.
2. **Learning objectives** set out examples of learning objectives for this module that can be adapted for a particular participant group.
3. **Testing knowledge** contains an example of a questionnaire that can be used to test participants' knowledge either at the start or at the end of a training course.
4. **Classroom exercises** provide examples of practical exercises that can be done in a classroom context by participants individually or in groups.
5. **Case studies** contain examples of case studies that can be used to get participants to think by using real-life scenarios.
6. **Field-based exercises** outline ideas for field visits that may be conducted during a longer training course.

CONTENTS

1. Tips for trainers

2. Learning objectives

3. Testing knowledge

Exercise 1: What do you know about the prevention and cure of micronutrient malnutrition?

Handout 1a: What do you know about the prevention and cure of micronutrient malnutrition? Questionnaire

Handout 1b: What do you know about the prevention and cure of micronutrient malnutrition? Questionnaire answers

4. Classroom exercises

Exercise 2: Planning an adequate general ration

Handout 2a: Planning an adequate general ration: Scenario

Handout 2b: Food composition table

Handout 2c: Planning an adequate general ration: Model answer

Exercise 3: Advocating for an adequate ration

Handout 3a: Advocating for an adequate ration: Scenario

5. Case studies

Exercise 4: Case Study: Bhutanese refugees in Nepal 1990-1993

Handout 4a: Case Study: Bhutanese refugees in Nepal 1990-1993

Handout 4b: Case study I: Bhutanese refugees in Nepal 1990-1993: Model answers

6. Field-based exercises

Exercise 5: Visit to a blended-food factory or mill producing fortified flour

Exercise 6: Field study

1. Tips for trainers

Step 1: Do the reading!

- Read Parts 1 and 2 of this module.
- Familiarize yourself with the technical terms from the glossary.
- Read through key documents (see full references of key documents and how to access them in Part 4 of this module).

Step 2: Know your audience!

- Find out about your participants in advance of the training:
 - How many participants will there be?
 - Do any of the participants already have experience in micronutrient malnutrition?
 - Could participants with micronutrient malnutrition experience be involved in the sessions by preparing a case study or contribute through describing their practical experience?

Step 3: Design the training!

- Decide how long the training will be and what activities can be covered within the available time. In general, the following guide can be used:
 - A **90-minute** classroom-based training can provide a basic overview.
 - A **half-day** classroom-based training can provide an overview of micronutrient malnutrition and include some practical exercises.
 - A **one-day** classroom-based training can provide a more in-depth understanding of micronutrient malnutrition and include a number of practical exercises and/or one case study.
 - A **three to eight-day** classroom plus field-based training can provide full training in order to carry out an actual assessment suitable for a particular context. This would include case studies and practical field exercises.
- Identify appropriate learning objectives. This will depend on your participants, their level of understanding and experience, and the aim and length of the training.
- Decide exactly which technical points to cover based on the learning objectives that you have identified.
- Divide the training into manageable sections. One session should generally not last longer than an hour.
- Ensure the training is a good combination of activities, e.g., mix PowerPoint presentations in plenary with more active participation through classroom-based exercises, mix individual work with group work.

Step 4: Get prepared!

- Prepare PowerPoint presentations with notes (if they are going to be used) in advance and do a trial run. Time yourself!
- Prepare exercises and case studies. These can be based on the examples given in this trainer's guide but should be adapted to be suitable for the particular training context.
- Prepare appropriate equipment for the session, such as calculators.
- Prepare a 'kit' of materials for each participant. These should be given out at the start of the training and should include:
 - Timetable showing break times (coffee and lunch) and individual sessions
 - Parts 1 and 2 of this module
 - Pens and paper

REMEMBER

People remember 20 per cent of what they are told, 40 per cent of what they are told and read, and 80 per cent of what they find out for themselves.

People learn differently. They learn from what they read, what they hear, what they see, what they discuss with others and what they explain to others. A good training is therefore one that offers a variety of learning methods which suit the variety of individuals in any group. Such variety will also help reinforce messages and ideas so that they are more likely to be learned.

2. Learning objectives

Below are examples of learning objectives for a session on micronutrient malnutrition. Trainers may wish to develop alternative learning objectives that are appropriate to their particular participant group. The number of learning objectives should be limited; up to five per day of training is appropriate. Each exercise should be related to at least one of the learning objectives.

Examples of learning objectives

At the end of the training participants will:

- Be able to describe the approaches available for the prevention and cure of micronutrient malnutrition.
- Be aware of the importance of supplementation in the treatment of micronutrient deficiency disease.
- Be aware of the importance of treating infections associated with micronutrient deficiency disease.
- Be aware of medical conditions that can give rise to micronutrient malnutrition.
- Know how to plan adequate general food rations.
- Know how to use NutVal software to assist in the planning of adequate general food rations.
- Be aware of the importance of advocating for rations that meet international standards in terms of micronutrient content.
- Understand the potential importance of complementary food rations in ensuring micronutrient adequacy
- Understand the importance of other public health approaches such as vaccination and good water and sanitation in reducing the risk of micronutrient malnutrition.
- Understand the importance of market access and viable livelihoods in ensuring the availability of, and access to, micronutrient rich foods.

3. Testing knowledge

This section contains one exercise which is an example of a questionnaire that can be used to test participants' knowledge on the cure and prevention of micronutrient malnutrition either at the start or at the end of a training session. The questionnaire can be adapted by the trainer to include questions relevant to the specific participant group.

Exercise 1: What do you know about the prevention and cure of micronutrient malnutrition?

What is the learning objective?

- To test participants' knowledge about the prevention and cure of micronutrient malnutrition

When should this exercise be done?

- *Either* at the start of a training session to establish the knowledge level of participants
- *Or* at the end of a training session to check how much participants have learned
It is possible to use the first six questions at the start and the last six at the end.

How long should the exercise take?

- 20 minutes

What materials are needed?

- **Handout 1a:** What do you know about the prevention and cure of micronutrient malnutrition? Questionnaire
- **Handout 1b:** What do you know about the prevention and cure of micronutrient malnutrition?
Questionnaire answers

What does the trainer need to prepare?

- Familiarize yourself with the questionnaire and answers.
- Add your own questions and answers based on your knowledge of the participants and their knowledge base.

Instructions

Step 1: Give each participant a copy of Handout 1a.

Step 2: Give participants 15 minutes to complete the whole questionnaire or 10 minutes for half of it.

Step 3: Give each participant a copy of Handout 1b or read out the answers.

Step 4: Give participants five minutes to mark their own questionnaires and clarify the answers where necessary.

Handout 1a: What do you know about the prevention and cure of micronutrient malnutrition? Questionnaire

Time for completion: 15 minutes

Answer all the questions. Choose ONE ANSWER ONLY for each question.

1. What is the most important advantage of calculating the micronutrient content of a food aid ration when you are planning a programme? *Circle the correct answer.*
 - a) Allows the nutritionist to minimise the weight of the ration
 - b) Helps to check that people will get adequate nutrients to avoid disease
 - c) Minimises the cost of the ration
 - d) Ensures the selected foods are culturally appropriate
2. Which of these programmes should be routinely done in emergency nutrition and health programmes? *Circle the correct answer.*
 - a) Iron and folate tablet distribution to pregnant women
 - b) Supply of iodized salt in the general ration
 - c) Vitamin A capsule distribution to pre-school children in areas with high child mortality
 - d) All of the above
3. Which of the following statements about micronutrient malnutrition is true? *Circle the correct answer.*
 - a) Micronutrient malnutrition only occurs if micronutrient intakes are too low
 - b) Micronutrient malnutrition only occurs if micronutrient intakes are too high
 - c) People can suffer harmful affects if their micronutrient intakes are either too low or too high
 - d) Food aid rations are always designed to ensure the micronutrient content is adequate
4. Which intervention is most likely to increase the micronutrient intake of the whole population? *Circle the correct answer.*
 - a) A standard iron and folate supplementation programme
 - b) A standard vitamin A supplementation programme
 - c) Promoting recommended infant and young child feeding practices
 - d) Improving the micronutrient content of the general food ration
5. Which of the following statements about micronutrient malnutrition is true? *Circle the correct answer.*
 - a) Women and children are the only people at risk of micronutrient deficiencies in emergencies.
 - b) Adolescents are not at risk of micronutrient malnutrition.
 - c) Adult males never suffer from micronutrient malnutrition.
 - d) Some micronutrient deficiency diseases affect adults more than children.
6. Which complementary public health intervention may help to reduce anaemia? *Circle the correct answer.*
 - a) Insecticide treated bed nets
 - b) De-worming medication in school children
 - c) Improved sanitation
 - d) All of the above

TRAINER'S GUIDE

7. Which statement is **NOT** true? *Circle the correct answer.*
- a) High dose vitamin A supplementation for children should be given as soon as possible in an emergency
 - b) High dose vitamin A supplementation can be integrated with vaccination campaigns
 - c) High dose vitamin A supplementation should be targeted at all pregnant women
 - d) High dose vitamin A supplementation has been shown to reduce mortality in children by 23 per cent in populations where there are clinical signs of deficiency
8. Tablets for routine prevention of anaemia in pregnant women should contain how much iron and folate? *Circle the correct answer.*
- a) 60mg of iron and 400mg of folate
 - b) 160mg of iron and 400µg of folate
 - c) 60mg of iron and 400µg of folate
 - d) 1000mg of iron and 1000µg of folate
9. Which food aid commodity is routinely fortified with micronutrients? *Circle the correct answer.*
- a) Wheat grain
 - b) Beans
 - c) Rice
 - d) Blended foods
10. Salt is routinely fortified with which fortificant? *Circle the correct answer.*
- a) Potassium iodate
 - b) Thiamine hydrochloride
 - c) Nicotinamide
 - d) Potassium chloride
11. Pellagra should be treated with which supplements? *Circle the correct answer.*
- a) Iron and vitamin A
 - b) Nicotinamide and B complex
 - c) Ascorbic acid
 - d) Selenium and zinc
12. Improving livelihoods and market access may reduce micronutrient deficiencies by? *Circle the correct answer.*
- a) Increasing the number of hours worked by parents.
 - b) Encouraging sale of livestock
 - c) Improving purchasing power and access to a more diverse range of foods
 - d) Decreasing the use of traditional foods

Handout 1b: What do you know about the prevention and cure of micronutrient malnutrition? Questionnaire answers

1. (b)
2. (d)
3. (c)
4. (d)
5. (d)
6. (d)
7. (c)
8. (c)
9. (d)
10. (a)
11. (b)
12. (c)

4. Classroom exercises

This section provides examples of practical exercises that can be carried out in a classroom context by participants individually or in groups. Practical exercises are useful between plenary sessions, where the trainer has done most of the talking, as they provide an opportunity for participants to engage actively in the session. The choice of classroom exercises will depend upon the learning objectives and the time available. Trainers should adapt the exercises presented in this section to make them appropriate to the particular participant group. Ideally, trainers should use case examples with which they are familiar.

Exercise 2: Planning an adequate general ration

What is the learning objective?

- To know how to plan adequate general food rations
- To know how to use NutVal software to assist in the planning of adequate general food rations

When should this exercise be done?

- After the main concepts about micronutrients have been introduced

How long should the exercise take?

- 1 hour and 15 minutes

What materials are needed?

- **Handout 2a:** Planning an adequate general ration
- **Handout 2b:** Food composition table
- **Handout 2c:** Planning an adequate general ration: model answers

What does the trainer need to prepare?

- Familiarize yourself with the calculations and results before the session and ensure handouts are available and the participants will have calculators ready.

Instructions

Step 1: Give each participant a copy of Handout 3a, explain the exercise, and let them work through it for 60 minutes. Provide support, if necessary.

Step 2: Hold a discussion for 15 minutes in plenary to address any important questions and confirm that participants understood the exercise and results.

Handout 2a: Planning an adequate general ration: Scenario**Time for completion:** 30 to 60 minutes**Read the following scenario and attempt the calculation.**

You are a nutritionist who has been reviewing the food assistance provided to a resident population in a famine-affected area. You have been asked to plan two rations based on different intervention strategies.

- A complementary food aid ration that is designed to complement the food that is still accessible to the famine-affected population and fill the energy and nutrient gap
- A general ration that is designed to provide a nutritionally balanced ration and deliver 2,100 kcal per person per day

The current ration being distributed to the famine affected population is given in the table below in grams/person/day.

Ration (grams/person/day)	
Maize grain	350
Beans	50
Oil	20

A survey has indicated that the non-aid foods being frequently consumed by the population include very few fruits and vegetables and no obvious sources of iodine.

The commodities that are immediately available to be added to the ration are CSB and salt, both conforming to WFP specifications.

- Initially you decide to focus on the probable deficiencies in iodine and vitamin C by providing a complementary food ration that will deliver the population requirement for these particular nutrients.

Calculate the minimum quantities of CSB and salt you would need to add to the ration to ensure it provides an adequate amount of vitamin C and iodine. Use the nutrient values given in the composition table (Handout 2b) to calculate this by hand or use NutVal software. Give your answer to the nearest whole gram.

Note that in a population with an average energy requirement of 2100 kcal the minimum amount of iodine required is 150 µg and the minimum amount of vitamin C required is 28 mg.

Only complete the remaining questions if using NutVal software.¹
There are many calculations involved!

- After you have done this calculation, the new ration containing the CSB and salt should contain 1798 kcal. Now you decide to design a general ration that will meet the complete food needs of the population. As a first step, increase the amount of oil until the requirement for 500 µg RE has been satisfied. What is the oil content of the ration now?
- Due to the presence of large stocks of maize in the warehouse you have been told by the programme manager that the maize ration will need to be increased to 400 g/person/day. After you have done that, also increase the quantity of beans until the energy and riboflavin requirements have been satisfied. What is the amount of beans in the ration now?
- To address the deficiency in calcium, increase the amount of beans in the ration to 100 grams and then find out how much CSB would need to be added to fulfil the calcium requirements. What is the CSB content of the ration now?
- Finally, to reduce the excessive energy content of the ration, reduce the maize content to 312g. Write down the final ration you have designed.
- Comment on the ration design and how it compares with the general food ration often used in actual food aid operations.

¹ NutVal is a spreadsheet application. The current version is designed to work with Excel 2003 and is available to download from: <http://www.nutval.net/>

Handout 2b: Food composition table

Nutrient content per 100 grams of raw uncooked food*

Commodity	Energy	Protein	Fat	Calcium	Iron	Iodine	Vitamin A	Vitamin B1 (Thiamine)	Vitamin B2 (Riboflavin)	Vitamin B3 (Niacin)	Vitamin C
	Kcal	(g)	(g)	(mg)	(mg)	µg	µg RE	(mg)	(mg)	(mg)	(mg)
Maize	350	10.0	4.0	7	2.7	0	0	0.39	0.20	2.2	0
Beans (dried)	335	20.0	1.2	143	8.2	0	0	0.50	0.22	6.2	0
Oil [^]	885	0.0	100.0	0	0.0	0	900	0.00	0.00	0.0	0
CSB [§]	400	18.0	6.0	181	12.8	2	501	0.44	0.70	10.0	50
Salt [~]	0	0	0	0	0	6,000	0	0.00	0.00	00.0	0

* Nutritional values are taken from the spreadsheet application NutVal 2006.

[^] Vitamin A-fortified according to WFP specifications

[§] Formulated according to WFP specifications

[~] Iodized according to WFP specifications (specifications define a range of 4450-7500µg iodine/100 g salt)

Handout 2c: Planning an adequate general ration: Model answers

1. Calculate the minimum quantities of CSB and salt you would need to add to the ration to ensure it provided an adequate amount of vitamin C and iodine. Use the nutrient values given in the composition table (Handout 2b) to calculate this by hand or use NutVal software. Give your answer to the nearest whole gram.

You would need to add 3 grams of salt and 57 grams of CSB to ensure the ration provided the minimum required amounts of iodine (150µg) and vitamin C (28mg) in a 2,100 kcal general ration. After the addition of 3 grams of salt and 57 grams of CSB the ration contains 181µg of iodine and 28 mg of vitamin C.

2. After you have done this calculation, the new ration containing the CSB and salt should contain 1798 kcal. Now you decide to design a general ration that will meet the complete food needs of the population. As a first step, increase the amount of oil until the requirement for 500 µg RE has been satisfied. What is the oil content of the ration now?

24 ml of oil.

3. Due to the presence of large stocks of maize in the warehouse you have been told by the programme manager that the maize ration will need to be increased to 400 g/person/day. After you have done that, also increase the quantity of beans until the energy and riboflavin requirements have been satisfied. What is the amount of beans in the ration now?

91 grams of beans.

4. To address the deficiency in calcium, increase the amount of beans in the ration to 100 grams and then find out how much CSB would need to be added to fulfil the calcium requirements. What is the CSB content of the ration now?

158 grams of CSB.

5. Finally, to reduce the excessive energy content of the ration, reduce the maize content to 312g. Write down the final ration you have designed.

The final ration composition should contain:

Maize grain (white)	312g
Beans, dried	100g
Oil, vegetable (WFP specifications)	24g
Salt (WFP specifications)	3g
CSB	158g

6. Comment on the ration design and how it compares with the general food ration often used in actual food aid operations.

The ration design contains less salt than is often provided and a lot more CSB. A typical CSB provision may be as little as 50 g per person per day. The cereal component of most rations also tends to be higher. However, as we saw in Module 4, the more conventional ration designs also tend to have poor micronutrient adequacy.

Exercise 3: Advocating for an adequate ration**What is the learning objective?**

- To be aware of the importance of advocating for rations that meet international standards in terms of micronutrient content

When should this exercise be done?

- After the main concepts have been introduced and exercises 1 and 2 have been completed

How long should the exercise take?

- 60 minutes

What materials are needed?

- **Handout 3a:** Advocating for an adequate ration: Scenario

What does the trainer need to prepare?

- Read and familiarise yourself with the scenario and descriptions. This is a fairly unstructured exercise that can go in several directions. While the role of political and organizational environment is something that participants should fully explore, try and ensure there is a reasonable amount of time spent on discussion of the technical issues. Obviously, the aim is to arrive at a point in the role play when the stakeholders start to agree that action to tackle the problem of Ariboflavinosis is required. How you get there and how long it takes will depend on the individual participants!

Instructions

Step 1: Introduce the exercise to the course participants.

Step 2: Allocate roles to different participants.

Step 3: Give the groups 10 minutes to familiarize themselves with their roles and briefs.

Step 4: Conduct the role play by chairing the meeting.

Step 5: Discuss the results.

Discussion points for feedback in plenary

- ➔ Every organization has its own perspective and interests.
- ➔ Different organizational priorities do not mean that organizations or individuals do not care about the health and welfare of refugees.
- ➔ How important is technical knowledge in the debate?

Handout 3a: Advocating for an adequate ration: Scenario

Time for completion: 40 minutes

The aim of this exercise is to encourage you to think around the complex issues that surround making decisions on the content of emergency food aid. This scenario focuses on a long-term refugee situation.

Read the following scenario and familiarize yourself with the role allocated to you by the trainer. Try to empathize with the role you have been assigned and to prepare to engage in the debate in a polite but enthusiastic way.

This scenario is set in a hypothetical country in Asia.²

A refugee population has been accommodated in the country for about five years in three different camps. There is widespread concern over the nutritional status of the refugees and nutritional surveys have reported a consistently high prevalence of angular stomatitis, a sign of vitamin B2 (riboflavin) deficiency. This has been a continuing problem since the start of the refugee operation. Analysis of the food aid ration confirms that it is a rice-based ration, heavily deficient in riboflavin.

A meeting has been called by UNHCR to discuss the results of the latest nutrition survey with the various stakeholders. The meeting will be chaired by the course trainer, who will take the role of UNHCR's Country Representative but will act impartially in the discussion. The first speaker invited to address the meeting will be the individual from the health and nutrition NGO, who will present the case for tackling the inadequate general ration. Once this person has spoken, others will be invited by the chair to share their perspectives.

Organizations represented

Ministry of Home Affairs of the host country – primarily concerned about internal security, social welfare, and law and order. Has responsibility for overseeing the refugee camps and is mandated by the government to bring about repatriation of the refugee to their country of origin at the earliest opportunity. However, the ministry is also concerned to uphold the host country's international reputation for observing international standards and human rights.

Your role: a senior civil servant of the ministry

UNHCR – responsible for overall coordination of the camps, registration of refugees, social and legal protection, and liaison with the national government, international donors and the embassies of donor governments in country. Under pressure from the host government to bring about repatriation of the refugees as soon as possible. Under pressure from some international donors to protect the rights of the refugees to remain in the host country and mindful of its own mandate to protect refugees. While responsible for carrying out the annual nutrition survey, the organization currently has no nutrition or health personnel employed on its staff and hires external consultants to conduct surveys and write reports.

Your role: a protection officer working in the camps. You are aware of the reports of riboflavin deficiency and have seen cases of angular stomatitis in refugee children. However, there are many difficult social protection issues to deal with and you are not convinced that riboflavin deficiency is a real priority.

WFP – responsible for providing the basic food commodities in the general ration. They also supply fortified biscuits for school feeding. Concerned by the continued reports of inadequate rations and riboflavin deficiency, WFP launched a programme to supply fortified biscuits for school feeding. Resources and technical solutions to improve the adequacy of the general ration seem difficult to obtain.

Your role: a programme officer. You have a background in management and logistics with no academic training in health or nutrition. However, you have attended a short course on nutrition and are aware of the issues. You have just been informed by your country office that resources are not available.

² Any similarity to a real country or situation is coincidental.

An international NGO responsible for camp management – The organization has a respected reputation in international emergency relief work and development projects. It has extensive experience of camp management but has no specialists in health and nutrition.

Your role: a programme manager. Having little knowledge of health or nutrition you are unconvinced of the seriousness of the problem and, frankly, wonder what all the fuss is about. Angular stomatitis is, after all, frequently seen in many children in the country, not just among refugees living in camps.

The national Red Cross/Red Crescent Society responsible for food distribution – As the national society, the organization has many volunteers and a well-established reputation, although it is not without critics. Within the camp it has responsibility for food storage and distribution.

Your role: a senior official in the organization in the society who has been involved with food distribution for several years. You are concerned that the operation is successful and that the refugees are seen to be doing well.

An international health and nutrition NGO running health services in the camps – The organization has a long and respected reputation in international emergency relief work. However, from the outside some perceive it as being a little arrogant and not very good at longer-term work and development activities. It identifies strongly with the refugee population and sees its role as ensuring they receive full rights and protection under international law. It undertakes onsite distribution monitoring (known locally as food basket monitoring) and has repeatedly advocated for beneficiaries to receive the full ration to which they are entitled. The distribution still, however, fails to achieve an average of 100 per cent of the planned ration.

Your role: a nutritionist! You are the only nutritionist at the meeting. You have also just collaborated on the most recent nutritional survey and worked closely with the UNHCR consultant in analysing data and writing the report. You are devastated that the internationally-funded relief effort has failed to provide adequate rations for so many years and has allowed the epidemic of ariboflavinosis to persist in pre-school children for so long. The latest survey shows a prevalence of 14 per cent (95% CI 12-16 per cent). This compares with 16 per cent last year and 13 per cent the year before. You are determined that at this meeting you will convince your colleagues in the other organisations that effective action is necessary.

A local human rights NGO

The organisation is concerned about the situation of the refugees but is only too aware that problems of poverty and poor nutrition affect large parts of the host country, including the communities that live adjacent to the refugee camps.

Your role: a human rights researcher. You are alarmed at the amount of resources being spent on the refugees when so many problems in your population go unaddressed. You want to see the refugees receive an adequate diet but want to also advocate for more resources to be made available for the people living in communities near to the refugee camps.

Exercise 4: Case Study: Bhutanese refugees in Nepal 1990-1993**What is the learning objective?**

- To be able to describe the approaches available for the prevention and cure of micronutrient malnutrition

When should this exercise be done?

- After completion of the theory component of the module

How long should the exercise take?

- 60 minutes

What materials are needed?

- **Handout 4a:** Case study I: Bhutanese refugees in Nepal 1990-1993
- **Handout 4b:** Case study I: Bhutanese refugees in Nepal 1990-1993: Model answers

What does the trainer need to prepare?

- Read and familiarize yourself with the scenario and answers. Consider how best to divide the course into working groups. It is usually most useful to try and create groups of mixed abilities and varying backgrounds. If you have been using NutVal software in your training, try and make it available for all the groups to use in their analysis.

Instructions

Step 1: Introduce the exercise and some of the background information to the course participants. Try to let the students read most the background information themselves.

Step 2: Divide students into groups and provide each group with copies of Handout 4a.

Step 3: Give the groups 30 minutes to work through the background information and discuss the question and their answers.

Step 4: Ask each group to briefly present their recommendations (five minutes maximum for each group).

Step 5: Provide a summary of the answers and discuss the results.

Discussion points for feedback in plenary

- ➔ Were there any other interventions that could have been considered?
- ➔ How easy is it to try and change people's food preparation and dietary habits?
- ➔ When and how will people change them?

(Generally, it is extremely difficult due to the many complex and powerful reasons that make people choose their diets. However, experience has shown that people will change their behaviour in response to effective marketing campaigns and some other factors.)

Handout 4a: Case Study: Bhutanese refugees in Nepal 1990-1993

The population

The first refugees began arriving in southeast Nepal from southern Bhutan after October 1990. The journey was a few days for the majority who arrived in lorries and buses. Camps began to develop in 1991, but the peak influx was during May 1992. By July 1992 there were over 50,000 refugees registered. The 'emergency phase' led into the 'care and maintenance phase' in late 1992. By January 1997 there were 91,801 registered refugees in seven camps, with several thousand unregistered who were living and working in Nepal. One fifth of the population is below 18 years of age, and 13 percent are less than five years of age.

The local environment

The narrow strip of land, which adjoins India along Nepal's southern border, is known as the Terai. It is only a few hundred feet above sea level, and until the 1950s and 1960s was jungle and sparsely inhabited due to rampant cases of malaria. The Jhapa district, where the camps are located, was cleared and is now one of the most densely populated areas in eastern Nepal and has the highest proportion of area under cultivation.

Other sources of food and income

The Terai is well served with buses and cycle rickshaws. Access to towns and markets is easy in terms of distance. There are ample seasonal opportunities for casual daily work. However, there is a numerically and politically significant number of landless Nepali citizens in the Terai who depend on casual daily work for subsistence. The refugees are willing to work for less pay, as they receive a full ration back at the camp. This has led to a policy of trying to limit numbers of refugees moving in and out of the camps. In this sense they are officially 'closed camps' but there are no physical barriers. The opportunity to work, albeit on a casual basis, is certainly a factor that directly influences food availability and the possibility of diet diversification among the refugee population.

Leadership structures

Each camp is divided into sectors and sub-sectors, with an average of 80 houses in each sector. Each sector has a sector head, and each sub-sector a male and female head. The functions of this camp management structure are distribution, administration, and peace and security. The structure resembles the administrative block system, which the refugees had in Bhutan. The Bhutanese are used to leaders having a strong influence over their daily life.

Malnutrition and micronutrient deficiencies

During the emergency phase, the main nutritional concern was acute malnutrition, iron deficiency anaemia and vitamin A deficiency, but not vitamin B and C deficiencies. By late 1992 malnutrition and mortality rates were considered to be at 'acceptable' levels.

An outbreak of suspected beriberi became apparent in September 1993, when an increasing number of patients with neurological symptoms were presenting at the health centres. From October, weekly surveillance figures were kept. Numbers of cases varied significantly from camp to camp. The time the cases had spent as refugees in the camp was reported as follows:

Time in camp (months)	% cases
< 6	5.4
6-11	18.5
12-17	41.5
18-23	23.1
24-29	3.1
30+	8.5

The general ration was set as follows:

	Grams per person per day
Polished rice	430.0
Pulses	60.0
Vegetable oil	25.0
Sugar	20.0
Salt	7.5
Vegetables	100-150

The actual average amounts received were calculated as follows:

	Grams per person per day
Polished rice	401.0
Pulses	57.0
Vegetable oil	25.0
Sugar	19.0
Salt	4.5
Vegetables	96-125

Refugees preferred polished rice to any other cereal, and many would wash their rice more than once before cooking, sometimes throwing this water away. Refugees traded or exchanged some of the pulses in their ration for other foods and non-food items.

Fortified blended food was only being used for supplementary feeding for malnourished children (less than 80 per cent WFH) and pregnant and lactating women.

Answer the questions.

You are a nutritionist on the UNHCR/WFP food assessment mission in early 1994.

1. What were the likely contributing factors of the outbreak of beriberi?
2. What are your recommendations for addressing this outbreak of beriberi? Justify your recommendations.

Handout 4b: Bhutanese refugees in Nepal 1990-1993: Model answers

1. What were the likely contributing factors of the outbreak of beriberi?

These include:

- The received ration looks, on first site, to be deficient in thiamine. Calculating the nutrient values using NutVal 2006 (assuming the vegetable content was actually 100g of dark green leafy vegetables) confirms this. The ration contains only 83 per cent (0.74mg) of the thiamine (and 25 per cent (0.35mg) of the riboflavin!) required in a general ration of 2100 kcal.
- Cooking practices that involve boiling and washing food several times are likely to reduce the B vitamin content of the ration still further.
- Pulses are the only thiamine rich food item in the ration. Unfortunately, they also tend to be traded or exchanged for other foods, which may not be a good source of thiamine, and non-food items.
- While work opportunities exist, the policy of trying to limit numbers moving in and out of the camps is presumably reducing the household income and the opportunities for diet diversification through purchase and trade.

2. What are your recommendations for addressing this outbreak of beriberi? Justify your recommendations.

Intervention options

a) Provision of parboiled rice

Parboiling of rice, rather than polishing, helps to retain the vitamin B content and makes rice easier to process by hand. The practice of parboiling rice is more than two thousand years old, and may have started in the Persian Gulf. Today, it is the preferred rice of many in the southern parts of the Indian subcontinent.

During processing, the rice is briefly boiled before being dried and stored. Parboiling rice drives nutrients, especially thiamine, from the bran into the grain, so that parboiled white rice is nutritionally similar to brown rice.

Advantages and disadvantages

In this population there is a strong cultural preference for polished rice (which has a low thiamine content). Introducing parboiled rice or other cereals with a better thiamine content may prove challenging. However, the strong role of the sector leaders in the camp may help encourage change, assuming they could be convinced of the benefits.

b) Inclusion of blended food in the ration

This would help to improve the micronutrient profile of the ration. Inclusion of 36 gram/person/day of WFP specification CSB or 30 gram/person/day of CSB of the United States specification would meet the general ration thiamine requirement.

Advantages and disadvantages

Blended food would improve the overall micronutrient profile of the ration, not just increase thiamine content. If adequate supplies can be obtained this would be a very useful addition to the ration.

There is no information on the cultural acceptability of the blended food, but it is likely to be preferentially consumed by children. Ideally, more information would be collected on the age profile of the patients being admitted for treatment for beriberi and about how the blended food would be used in the population. A programme of information, education and communication activities would be required before introducing this new food or if trying to change food preparation practices, as noted above in option a).

c) Improving access to employment opportunities

Removing restrictions on entering and leaving the camps might help to increase household income, reduce the sale of food aid pulses and improve dietary diversity.

Advantages and disadvantages

Increasing the self-sufficiency of refugees and stimulating the local economy could be two positive side effects of this option.

Increasing access to work might be politically difficult and might also risk resentment from the local host community if the price of labour was reduced by the additional supply of workers. More information on the availability of thiamine rich foods in local markets and would be useful in evaluating this option.

d) Provision of treatment for infantile beriberi

Infant mortality rates are not included in the briefing. These should be looked into urgently as infantile beriberi may be an important cause of mortality in this thiamine-deficient population. In the meantime, medical staff should be made aware of the possible occurrence of infantile beriberi, a case definition agreed upon and medical supplies for treatment (thiamine injections and oral supplements) procured.

Advantages and disadvantages

This is an important approach to control possible excess mortality, but it should be accompanied by preventative approaches. Care should be taken that concern over infantile beriberi does not undermine the promotion of exclusive breastfeeding.

e) Supplementary feeding and/or supplementation of pregnant women

Due to the risk of infantile beriberi, a supplementary feeding programme and/or supplementation programme should be started for pregnant women.

Advantages and disadvantages

This is an important preventative strategy, but will not deal with the problem for the whole population.

6. Field based exercises

The section outlines ideas for exercises that can be carried out as part of a field visit. Field visits require a lot of preparation. An organization that is actively involved in programming or nutrition surveillance has to be identified to 'host' the visit. This could be a government agency, an international NGO or a United Nations agency. The agency needs to identify an area that can be easily and safely visited by participants. Permission has to be sought from all the relevant authorities and care taken not to disrupt or take time away from programming activities. Despite these caveats, field based learning is probably the best way of providing information that participants will remember.

Exercise 5: Visit to a blended-food factory or mill producing fortified flour

What is the learning objective?

- To allow participants to observe food fortification in an established commercial factory and gain awareness of the processes involved. The factory should preferably be engaged in the manufacture of food aid products, e.g., blended foods, fortified maize, etc.

When should this exercise be done?

- During or after completion of the module

How long should the exercise take?

- 1 day to organize
- Half day to 1 day to undertake

What materials are needed?

- Agreement with the company running the factory
- Permission from the training institution for the visit to go ahead
- If necessary, risk assessment forms to be prepared and completed by the trainer prior to the field trip

What does the trainer need to prepare?

- An itinerary for the factory visit
- A plan for transportation, accommodation and meals for participants
- A briefing sheet for the participants on the local situation including safety and security procedures
- To ensure that participants are suitably dressed and equipped for the visit, and have note pads and pens
- Prior to the visit, work in a group with the participants to construct an observation checklist of things to look out for, e.g. how is the food processed prior to fortification; what fortificants are used; how is the addition of fortificants monitored; how are the end products packaged and labelled; what quality control checks are made (See list below).

Exercise 5: Visit to a blended-food factory or mill producing fortified flour (continued)**Discussion points for feedback in plenary**

- ➔ General impressions of the factory and fortification process
- ➔ Relevance of the manufactured products for food aid operations
- ➔ Are the micronutrient fortification levels of the product appropriate for what is needed in the field?
- ➔ Why the date of manufacture is important in finding out if a fortified food is still fit for consumption and fortified at the stated levels.
- ➔ Why the batch number may be important in tracing the source of faulty food products. Quality problems in the past have included infestation, coarsely milled products and flavour taints.

The following is a suggested activity that should be adapted to fit the local context.

Arrange a visit to a blended-food factory or flour mill producing fortified flour products used in food aid programmes. Allow students to observe the food processing and fortification process.

- For all fieldwork and visits, a risk assessment must be undertaken to look at the risks involved to the course participants, local staff and beneficiaries.
- Every effort must be taken to minimize disruption to the ongoing work of the programme.
- Trainers and students must act with tact and discretion and avoid open criticism of any activities they see. Observations should be discussed with trainers at the end of the field visit.

Key observation points for participants

(To be adapted according to the local situation)

1. What is in the product being manufactured?
2. What are the ingredients and where have they been procured?
3. How are the ingredients processed and mixed?
4. What quality control checks are carried out on the ingredients?
5. Which fortificants are added to the product?
6. Where are the fortificants manufactured?
7. How are the fortificants measured and mixed with the food product?
8. How is the end product packaged and labelled?
9. Is there a manufacturing batch number?
10. Is a 'use by', 'manufactured on', or 'best before' date included on the packaging?
11. What quality control checks are performed on the finished product?
12. Which agencies and food aid operations are the products used in?

Exercise 6: Field study

The section outlines ideas for exercises that can be carried out as part of a field visit. Field visits require a lot of preparation. An organization that is actively involved in programming or nutrition surveillance has to be identified to 'host' the visit. This could be a government agency, an international NGO or a United Nations agency. The agency needs to identify an area that can be easily and safely visited by participants. Permission has to be sought from all the relevant authorities and care taken not to disrupt or take time away from programming activities. Despite these caveats, field based learning is probably the best way of providing information that participants will remember.

What is the learning objective?

- To allow participants to observe micronutrient malnutrition prevention and curative activities in an established refugee camp

When should this exercise be done?

- After completion of the module material including the previous exercises

How long should the exercise take?

- 1 day to organize, and 1 to 2 days, or as dictated by local circumstances

What materials are needed?

- Letters of agreement with the NGO or United Nations agency hosting the visit
- Permission from the training institution for the visit
- Risk assessment forms to be prepared and completed by the trainer prior to the field trip

What does the trainer need to prepare?

- A full itinerary for the field visit
- A plan for transportation, accommodation, meals and refreshments for participants
- A briefing sheet for the participants on the local situation including safety and security procedures
- To ensure that participants are suitably dressed and equipped for the field visit, and have note pads and pens
- Prior to the visit work in a group with the participants, to construct an observation checklist of things to look for, e.g., number of refugee households with access to home gardens, provision of micronutrient supplements at health facilities, etc.

Discussion points for feedback in plenary

- ➔ General impressions of the field site visited
- ➔ Detailed observations on the micronutrient malnutrition programmes in the site visited
- ➔ Ideas for improving the technical content and management of the programme

The following is a suggested activity that should be adapted to fit the local context. It would be preferable to combine this field activity with that described in Module 4 as there are many areas of overlap.

Arrange a visit to a refugee camp to observe general ration distribution, onsite distribution monitoring, post distribution monitoring, and how data is collected for the health information system. If possible, data should be collected and analysed for micronutrient content and energy and macronutrient sufficiency.

- For all fieldwork and visits, a risk assessment must be undertaken to look at the risks involved to the course participants, local staff and beneficiaries.
- Every effort must be taken to minimize disruption to the ongoing work of the programme.
- Trainers and students must act with tact and discretion and avoid open criticism of any program activities they see. Observations should be discussed with trainers at the end of the field visit.

Key observation points for participant (To be adapted according to the local situation)

In addition to the observation points listed for the field exercise in Module 4, the following should be included:

1. Is there an iron/folate supplementation programme running for pregnant women? If yes,
 - a. What is the composition of the supplements and where are they procured from?
 - b. How are the iron/folate supplements distributed?
 - c. Is there any data on adherence?
2. Is there a vitamin A capsule distribution programme? If yes,
 - a. What is the composition of the supplements and where are they procured from?
 - b. How and how often are they distributed?
 - c. Which population group/s receive the supplements?
 - d. Is there any data on coverage?
3. What fortified foods are supplied in the general ration?
4. What are the ingredients and composition of those foods? (This may be difficult or impossible to find out in some cases.)
5. What are the 'date of manufacture'; 'best before' or 'use by' dates for the products (Some products may not have these!)
6. Where were they manufactured and by which company? (This may be difficult or impossible to find out in some cases.)
7. What are the manufacturing batch numbers of the food products?
8. Is there any information on which groups of the population consume the fortified products, how, and in what amounts?
9. Have health staff diagnosed any cases of micronutrient deficiencies? If yes, how did they treat these?
10. Which micronutrient supplements are available for use in the medical stores?

