



Building
Nutritious
Food Baskets

Biofortification

Facilitator's Guide



Training of Trainers (ToT) Module on Biofortification: A Sustainable Solution to Hidden Hunger

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Contents

Acknowledgement	iv
Foreword.....	iv
Acronyms	v
How to Facilitate This Training Module	1
Biofortification Module Overview	14
Module Objectives	14
Module Outline	14
Unit 1 – Introductions and Housekeeping	15
1.1 Key Points.....	15
1.2 Adaptations.....	15
1.3 Activities.....	16
Suggested Icebreaker exercises	16
Unit 2 - Micronutrients and Biofortification	17
2.1 Objectives.....	17
2.2 Synopsis.....	17
2.3 Key Points.....	17
2.4 Adaptations.....	17
Unit 3 - Developing Biofortified Crops	18
3.1 Objectives.....	18
3.2 Synopsis.....	18
3.3 Key Points.....	18
3.4 Adaptations.....	18
3.5 Activities.....	19
Unit 4 - Fostering Demand for Biofortified Crops.....	20
4.1 Objectives.....	20
4.2 Synopsis.....	20
4.3 Key Points.....	20
4.4 Adaptations.....	20
4.5 Activities.....	21
Unit 5 - Scaling Biofortification	23
5.1 Objectives.....	23
5.2 Synopsis.....	23

5.3 Key Points.....	23
5.4 Adaptations.....	23
5.5 Activities.....	24
Unit 6 - Conclusion	25



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Acronyms and Abbreviations

ALT	Adult Learning Theory
BNFB	Building Nutritious Food Baskets
BPI	Bio-fortification Priority Index
CGIAR	Global Research Partnership for a Food Secure
CIAT	International Center for Tropical Agriculture
CIMMYT	International Wheat and Maize Improvement Center
CIP	International Potato Center
FARA	Forum for Agricultural Research in Africa
IITA	International Institute of Tropical Agriculture
NEPAD	New Partnership for Africa's Development
NGO	Non- Governmental Organization
PVA	Pro-Vitamin A
SSA	Sub-Saharan Africa
TOT	Training of Trainers

Foreword

Biofortification is the process of increasing nutritional value of food crops by increasing the density of vitamins and minerals in a crop through either conventional plant breeding, agronomic practices or biotechnology. It is one of the key nutrition interventions that addresses micronutrient malnutrition among populations / groups who consume most of the staple foods that they produce, especially the poor, rural, and other vulnerable populations. Often, they have limited access to diverse diets, supplements, and commercially fortified foods that provide essential micronutrients necessary for ensuring healthy and productive lives. Adoption of biofortified food crops such as vitamin A rich orange-fleshed sweetpotato (OFSP); provitamin A (PVA) maize, high iron and zinc beans and vitamin A cassava, is an effective way of addressing micronutrients malnutrition because it is sustainable, cost-effective and culturally acceptable.

The Building Nutritious Food Baskets ([BNFB](#)) project is a three-year project (November 2015 to October 2018) implemented in Nigeria and Tanzania and funded by the Bill & Melinda Gates Foundation. The goal of the project is to accelerate and support scaling up of biofortified crops for food and nutrition security and to help reduce hidden hunger by catalyzing sustainable investment for the utilization of biofortified crops (OFSP, PVA maize, high iron beans and vitamin A cassava) at scale. [BNFB](#) develops institutional, community and individual capacities to produce and consume biofortified crops. The objectives of the project are to strengthen the enabling environment for increased investments in biofortified crops and to develop institutional and individual capacities to produce and consume biofortified crops.

To sustainably support the implementation of BNFB's capacity development efforts, the project has developed a training of trainers (ToT) module titled *[Training Module on Biofortification: A Sustainable Solution to Hidden Hunger](#)*. The module includes a PowerPoint presentation, an annotated facilitator's guide and a handout for participants. It is useful for setting the context or as an introduction to biofortification during training on specific biofortified crops, for example the ToT module on *Everything You Ever Wanted to Know about Sweetpotato*, the ToT module on *ProVitamin A Maize: A Biofortified Solution for Vitamin A Deficiency* and the ToT module on *High-Iron Beans: A Biofortified Solution for Iron Deficiency*. However, it is also self-contained and may be delivered independently if that is more appropriate for the target audience. Partner institutions; academic institutions and other users are encouraged to adapt and reproduce these instructional materials and where appropriate, integrate the teaching and learning into existing curriculum.

This module is designed to potentially serve a wide variety of audiences (nutritionists and agronomists, policymakers, extension workers, community development workers, farmers etc.). Not all the materials will be relevant to all audiences but facilitators can adapt the content to their audience and facilitation best practices. To ensure sustainability and wide reach; BNFB will apply a cascading approach in the delivery of training; where key experts (agriculturalists, nutritionists, health workers, marketing and gender experts) will attend more detailed ToT workshops. The experts trained will then become primary facilitators and drive the agenda for biofortification. They will in turn deliver shorter version courses and step-down the training to various levels of audiences (secondary and tertiary). This trend will continue until the training cascades down to "farmer trainers" who finally train the end users in their communities.

This module greatly contributes to BNFB's efforts in strengthening institutional and community capabilities to produce and consume biofortified crops (entire value chains) and to reach a critical mass.

Dr Hilda Munya

Project Manager - Building Nutritious Food Baskets Project (BNFB), International Potato Center - March 2018



How to Facilitate This Training Module

Overview

This training module is part of a series on biofortification and biofortified crops. At present, the series includes modules on:

- Biofortification
- High Iron Beans
- Provitamin A Maize

Each module consists of:

- A **PowerPoint presentation**,
- An annotated **facilitator's guide** and
- A **handout** for participants.

While we would encourage you to present the introductory “Biofortification” module before presenting the modules on specific crops, each module is self-contained and may be delivered independently if that is more appropriate for your audience.

Adapting the Materials for Your Specific Audience

The modules in this series have been designed to potentially serve a wide range of audiences, including:

- Agriculturalists and nutritionists
- Policymakers
- Government and NGO agricultural extension workers
- Farmers and other stakeholders in agricultural value chains

Not all the material included in the modules will be relevant for all these groups. Therefore, you are strongly encouraged to:

1. **REVIEW THE PRESENTATION MATERIALS** in advance and add, remove or edit slides or sections as necessary to better suit the specific needs, interests and knowledge level of your intended audience
2. **REHEARSE THE PRESENTATION** in advance to confirm that you will be able to cover the most important concepts in the time allotted, with adequate time left over for discussions and activities
3. **PRACTICE THE ACTIVITIES** with your colleagues before delivering the training, to confirm that you understand how to deliver them and know what supplies/materials you will need to bring on the day of training

Suggestions have been provided in the facilitator's guide and PowerPoint presentation notes to help you adapt the materials to specific audiences, though ultimately you will need to use your own best judgement.

Training Methodology / Adult Learning Principles

The training materials have been designed to help you, the facilitator, deliver the module in a way that follows adult learning principles and best practices.

While we will provide specific recommendations for facilitating each type of activity later in this guide, the table below provides a high-level synopsis of our recommendations.

Principle	Best Practice	What NOT to do
People process information best when visuals aids are used to enhance a presentation	<ul style="list-style-type: none"> Rehearse the presentation, and familiarize yourself with the slide deck, so you can deliver the training in a natural, conversational style Face the audience and make eye contact with participants (to whatever extent is culturally appropriate) 	<ul style="list-style-type: none"> Stare at the screen or your notes and read the text word-for-word
Adults learn best when they take an active role in the learning experience	<ul style="list-style-type: none"> Engage learners in a dialogue through discussion questions. Direct questions to specific participants throughout the session 	<ul style="list-style-type: none"> Lecture for extended periods of time without giving learners a chance to participate in discussions, ask questions and/or engage in activities Allow one or two highly assertive participants to dominate discussions and activities, denying others the chance to participate
People are more likely to comprehend and retain new skills and concepts if they can relate them to their prior knowledge , and connect them to things they already know/believe/understand	<ul style="list-style-type: none"> Use discussion questions and brainstorming sessions to activate participants' prior knowledge, and highlight how the information you are about to cover relates to what they already know 	<ul style="list-style-type: none"> Present new information without helping participants place it in context

Principle	Best Practice	What NOT to do
Adults learn best when they can relate concepts and skills to their personal experience / job responsibilities	<ul style="list-style-type: none"> Edit the materials and remove / reduce any sections that are not relevant to your audience's work, or that your audience would already know Provide specific examples of how concepts apply to participants' work Use discussion and "Quick Survey" questions as an opportunity for participants to relate skills and concepts to their work 	<ul style="list-style-type: none"> Spend large amounts of time going into the details of concepts that are not particularly relevant to your audience Spend large amounts of time covering information that your audience would already know Present new information without providing some real-world context of how participants might use it in their work
People are more likely to retain and use skills and concepts that they learn through self-discovery	<ul style="list-style-type: none"> Use discussions as a chance for learners to arrive at key concepts through critical thinking and debate Use activities to help participants practice skills and discover key concepts through trial-and-error 	<ul style="list-style-type: none"> Intervene in discussions and activities and tell/show participants the "right" response or outcome, without first giving them a chance to arrive at the conclusion, themselves
Participants will retain information better if they are asked to actively recall it during the session	<ul style="list-style-type: none"> Use the "Quick Review" questions as a chance for participants to actively recall information 	<ul style="list-style-type: none"> Skip review questions Allow one or two participants to answer all the review questions
Facilitators should periodically check for understanding , to confirm that participants comprehend and retain information as it is presented	<ul style="list-style-type: none"> Use discussion and review questions to check for understanding Direct questions to specific participants throughout the session If participants do not answer review questions correctly, take a moment to review/revisit any points of confusion then ask again 	<ul style="list-style-type: none"> Simply ask "Any questions?" at the end of a section and assume that participants understood if they do not ask questions Treat review questions as a test and blame participants for not comprehending the course content Allow one or two participants to answer all the review questions



How to Use the PowerPoint Presentation

The PowerPoint presentation serves several functions:

- Offer visual reinforcement for participants
- Serve as an outline for the facilitator
- Indicate when the facilitator should break for discussion and review questions
- Provide general instructions for activities

Icons

Certain slides have symbols in the header or footer that provide the facilitator with additional guidance:

Brainstorming

Comparing strategies

How is biofortification different from food fortification?

How is biofortification different from dietary diversification?

What are some unique advantages of biofortification compared to other strategies?

56 ◇ ⏱ 7 m

Below, find a list and explanations of the icons:

Icon	Description
Xm	Expected Duration, minutes
	Quick Review/Survey Questions
	Brainstorming Session
	Discussion Session
	Group Activity
	Animated Slide
	End of Animation

“Expected Duration”

The various question, discussion and activity slides have an “expected duration” to indicate how long that part of the presentation should reasonably take.

Not every slide has an expected duration. You should time yourself during rehearsals to ensure that you are able to complete the presentation in the time allotted, with enough time left over for discussions, activities and a 30- to 60-minute buffer at the end.

Time Management Tips

- Explain up front that, while everyone will get a chance to answer questions and participate in discussions, not everyone will get a chance to answer *every* question and participate in *every* discussion and that, for the sake of time, you might need to cut some discussions short.
- If a participant gives a long, unfocused response, ask guiding questions to help them reach a conclusion and/or summarize what the participant has said thus far then continue on or invite another participant to contribute
- For activities and discussions, notify the group when there is one minute or half a minute remaining, as appropriate
- If a group discussion goes off topic, make a note of the subject being discussed and say the class can revisit it at the end of the day (people will likely forget in the interim)
- If a discussion goes over time, wait for a pause then intervene, summarize the points raised in the discussion, then move on to the next part of the module





Quick Review/Survey Questions

Quick Review

“Micronutrient malnutrition” refers to a lack of:

- Calories
- Vitamins and minerals
- Protein
- Beneficial microbes in the digestive system

24 ◆ ⌚ 1 m

Purpose

The Review/Survey Question slides serve two purposes:

- As a **check for understanding**, to confirm that the participants understood the information that was just presented
- To improve retention through **active recall**, by forcing participants to remember details of what was just presented

Instructions

- For review questions, correct answers can be found in the PowerPoint presentation notes
- Most sections will end with several slides featuring multiple choice questions followed by an “alternate” slide with free-response questions. The facilitator should decide which questions to use, based on the size of the audience and personal preference
 - With large audiences (more than 16), multiple choice questions might be faster, and can potentially allow more people to answer.
 - You can either direct the question to an individual or have the entire class answer through a show of hands / mobile response clickers.
 - If using mobile response clickers, you will need to format the question slides as necessary for your specific brand/model of clicker. For example: <https://www.turningtechnologies.com/response-options>
 - With smaller audiences (fewer than 16), free response questions can often give you a better sense of how well learners understand the concepts, but you will need to be mindful of time.



Best Practices

If	Do	Do NOT
Participants do not answer the questions correctly.	<ul style="list-style-type: none"> Go back and review any concepts / key points that the participants did not understand, then ask again. 	<ul style="list-style-type: none"> Tell the participants they are “wrong” Answer the question yourself without reviewing the concept first.
One or two participants answer most of the review questions	<ul style="list-style-type: none"> Direct questions to other participants Tell the dominating participant(s) that we need to hear from others. Switch to having the entire class answer, using clickers or a show of hands 	<ul style="list-style-type: none"> Allow one or two participant(s) to dominate
When answering via a show of hands, participants seem to be going with whatever the majority decides.	<ul style="list-style-type: none"> Instead of using a show of hands, direct the question to individuals or to pairs of individuals (“<i>Miguel and Isobel – what are the three types of malnutrition?</i>”) Use mobile response clickers and set the slide to not display answers until everyone has responded. 	<ul style="list-style-type: none"> Assume most participants understand just because the majority are selecting the correct response via show of hands



Brainstorming Session

Brainstorming

Symptoms of malnutrition

What are the **visible** symptoms of macronutrient (calorie/protein) deficiency?

What are the **visible** symptoms of micronutrient (vitamin/mineral) deficiency?

28 3 m

Purpose

The Brainstorming Session slides allow participants to **activate prior knowledge**, by relating what they already know to any new information received in the training course. People generally comprehend and retain new information and ideas better when they can connect it to ideas they already know/believe.

Instructions

- A list of possible responses can be found in the PowerPoint presentation notes (note that this list is not necessarily complete – there may be other valid responses)
- Give the prompt, then encourage the class to think of as many possible responses as they can
- Write down the group's responses on a flip chart, whiteboard or other surface.
 - For each brainstorming session, you can assign the task of writing down the responses to a different participant, if you feel that might help them feel more engaged.



Best Practices

If	Do	Do NOT
Participants do not volunteer any responses	<ul style="list-style-type: none"> Ask guiding questions. For example, if asking participants to list vitamins and minerals say “<i>What do we need for strong bones?</i>” or “<i>What vitamin is in orange juice?</i>” Direct the question to a specific participant “<i>Caroline, any ideas?</i>” 	<ul style="list-style-type: none"> Start listing answers, yourself Skip ahead without listing any answers
One or two participants dominate	<ul style="list-style-type: none"> Thank them for their input, then invite other participants to reply (“<i>Thank you, James – Prasanth, can you name some vitamins and minerals?</i>”) 	<ul style="list-style-type: none"> Allow one or two participants to dominate
Responses are incorrect / off-topic	<ul style="list-style-type: none"> Ask guiding questions Advance to the next slide, which will typically have a list of valid responses, and say something like “<i>Okay, here are some answers – how many of these did we identify?</i>” 	<ul style="list-style-type: none"> Tell participants they are “<i>wrong</i>” Allow the brainstorming session to continue off-topic for a long time



Discussion Section

Discussion



*If calories, fats and protein are examples of “**macronutrients**”, what do you think is meant by the term “**micronutrients**”?*

“ 13 | 5 m ”

Purpose

The Discussion Session slides encourage participants to:

- **Learn through self-discovery** – Giving participants the chance to arrive at key concepts on their own, versus simply explaining the concepts to them, can improve engagement, comprehension and retention.
- **Relate concepts to their personal experience / job responsibilities** – If participants see the relevance of the course content to their own life/work, it will increase their engagement and boost long-term retention
- **Think critically** about the concepts presented in the course, improving comprehension and the likelihood that they will apply the concepts later in their work.
- **Take an active role in the learning experience** by sharing ideas with other participants and helping each other to learn.

Instructions

- Present the class with the prompt, then allow them to discuss amongst themselves
- Ensure that participants treat each other with respect and that everyone – not just the most assertive participants – is given a chance to be heard
- Gently guide the discussion with prompts and leading questions to ensure that it stays on-topic
- Be mindful of time, and politely bring the discussion to a conclusion if you are nearing the end of the expected duration (unless you are ahead of schedule, in which case the facilitator may – at their discretion – allow the discussion to continue for longer).



Best Practices

If	Do	Do NOT
Learners do not initiate discussion	<ul style="list-style-type: none"> If the question is general, try relating it to a specific, concrete example. E.g., if the question is about disaster preparedness, ask <i>"What steps could have been taken to mitigate the damage from last year's floods?"</i> Invite specific participants to share their personal experience: <i>"Mahmood, have you encountered this issue in your own work?"</i> 	<ul style="list-style-type: none"> Skip the discussion Tell participants what conclusions they are expected to reach
One or two participants dominate	<ul style="list-style-type: none"> Thank them for their input, then invite other participants to reply ("Thank you, James – Prasanth, can you name some vitamins and minerals?") Pass around an object to indicate who is allowed to speak, and make sure it is circulated around the entire class 	<ul style="list-style-type: none"> Allow one or two participants to dominate
Responses are incorrect / off-topic	<ul style="list-style-type: none"> Ask guiding questions Politely point out that the current subject of conversation is off-topic, and write a note to revisit it at the end of the day (odds are participants will forget) 	<ul style="list-style-type: none"> Tell participants they are "wrong" Allow the brainstorming session to continue off-topic for a long time
Discussion runs over time	<ul style="list-style-type: none"> Summarize the points raised in the discussion thus far and move on 	<ul style="list-style-type: none"> Impose <i>too much</i> closure by drawing conclusions participants did not reach, (it is OK to leave some questions open/unresolved)





Group Activities

Activity (Groups)

Labeling

- Divide into groups
- Each group should design a label for biofortified products
 - Convey essential information for consumers as succinctly as possible
 - Give sense of benefits
 - Include an appropriate, distinctive symbol



182 30 m

Purpose

The Group Activities offer participants a chance to:

- **Learn through self-discovery** – Giving participants the chance to discover key concepts through trial-and-error practice, versus simply explaining the concepts to them, can improve engagement, comprehension and retention.
- **Apply concepts from the course to solve real-world problems** – If participants see how the course content applies to real-world situations, it will increase their engagement and the likelihood that they will apply the concepts later in their work.
- **Think critically** about the concepts presented in the course, improving comprehension and the likelihood that they will apply the concepts later in their work.
- **Take an active role in the learning experience** by sharing ideas with other participants and helping each other to learn.

Instructions

- Review the activity instructions with the class
- Quickly divide the class into groups (usually of 3 to 5)
- Let participants know how much time they have to complete the activity
- Observe the groups, answer questions that arise provide clarification / direction as needed
- Ensure that everyone is actively participating and no one is dominating the group
- Be mindful of time, and remind groups of the time remaining as you near the end of the expected duration.
- Ask questions and give participants time to reflect on the activity afterwards, during debriefing



Best Practices

If	Do	Do NOT
Participants seem to fundamentally misunderstand the activity or not understand the instructions	<ul style="list-style-type: none"> Re-explain the instructions and answer any questions 	<ul style="list-style-type: none"> Intervene and start completing the activity for the group, yourself Explain the desired outcome or divulge too much information, denying learners the chance to learn through self-discovery
One or two learners are doing all the work while other learners seem disinterested / disengaged	<ul style="list-style-type: none"> Assign specific roles / responsibilities to each team member, to ensure everyone contributes Ask the disinterested / disengaged learners questions, or ask them to summarize the group's progress, which may prompt them to re-engage Have smaller groups to increase individual accountability Change groups for the next activity, to ensure the dynamic does not continue 	<ul style="list-style-type: none"> Directly confront disinterested learners about their non-participation
Group members argue with one another	<ul style="list-style-type: none"> Remind participants to be civil Ask participants to summarize the points of conflict Look for points of agreement Encourage group to refocus on problem solving 	<ul style="list-style-type: none"> Ignore the conflict Favor one participant over another

Biofortification Module Overview

Module Objectives

Upon completing this module, participants should be able to:

- Explain how biofortification can address micronutrient malnutrition among vulnerable populations
- Compare biofortification to other common interventions for micronutrient malnutrition
- Summarize the process that breeders follow to produce biofortified varieties of staple crops
- Outline strategies for promoting biofortified crops to farmers, consumers and partner organizations
- Describe the ways that international, national and local stakeholders can help to make biofortification sustainable over the long term

Module Outline

The 'Biofortification' module is divided into units and sub-units, as follows:

- 1) Introductions and housekeeping
- 2) Micronutrients and biofortification: An introduction
 - a) The problem of "hidden hunger"
 - b) Biofortification: An intervention for "hidden hunger"
- 3) Developing biofortified crops
 - a) Developing biofortified crops to address micronutrient malnutrition
 - b) The breeding process
- 4) Fostering demand for biofortified crops
 - a) Introducing biofortified crops
 - b) Promoting farmer adoption
 - c) Promoting consumer demand
 - d) Nutrition messaging
 - e) Engaging partners
 - f) Technical support and research
- 5) Scaling biofortification
- 6) Conclusion



Unit 1 – Introductions and Housekeeping

1.1 Key Points

- Welcome participants and introduce the course topic
- Do a very quick assessment participants' prior knowledge and experience with the topic
- Explain course objectives
- Cover essential housekeeping information (facilities, breaks, lunch etc.)
- Explain the “ground rules”
- Establish presenter's credibility
- Get people to know each other, particularly if participants are from different organisations or countries
- Help people start talking and feel more comfortable

1.2 Adaptations

Feel free to create your own “Ground Rules” but we recommend...

- Mobile phones off
- In addition to lecturing, there will be opportunities for discussions and asking questions.
 - To keep things moving, we might have to cut some conversations short and move on to the next topic
 - Not everyone will get to answer every question, but everyone will get multiple chances to speak and be heard throughout the session
 - If one or two people are answering every question, we will politely ask them to give someone else a chance to speak.
- As participants in this learning experience, we need to:
 - Share our ideas without fear of criticism, and listen to the ideas of others without criticizing
 - Engage in discussions without arguing
 - Help other participants and accept help from others
 - Create a safe, supportive environment for everyone to learn
 - Have fun



1.3 Activities

Suggested Icebreaker exercises

For small-mid size audience (up to 30 people):

Ask everyone to find a stranger and briefly interview them about:

- What they do
- Where they work and how long they've been working there
- Any interesting personal trivia / What they like to do for fun outside of work

After 5 minutes, go around the circle and have each participant introduce the person they interviewed to the group.

For larger audiences (>30 people):

Ask people to get up (and then sit down after each question) if they:

- Were born in July
- Have a pet (or ever had a pet in their lives)
- Play a musical instrument
- Speak [language other than the language of instruction]
- Love [popular food item]
- Are the youngest child in your family
- Didn't get up yet in response to any of these questions

Conclude by saying: "*There is something we all have just learned about each other, but we learned the most about the last group of people – we know that they aren't born in July, never had pets, don't play any instruments, etc.*"



Unit 2 - Micronutrients and Biofortification

2.1 Objectives

By the end of this unit, participants should be able to:

- List and describe the three types of malnutrition
- Define 'hidden hunger' and explain the importance of micronutrients for good health
- Identify natural sources of micronutrients
- List and describe common interventions for micronutrient deficiency
- Define 'biofortification'
- Compare biofortification to other interventions and summarize its major advantages and challenges
- Differentiate between biofortified crops produced through selective breeding and GMOs

2.2 Synopsis

This unit introduces the basic concepts of micronutrient malnutrition and biofortification.

2.3 Key Points

- Micronutrient malnutrition is a serious public health issue
- While everyone is affected, children and women of reproductive age are most vulnerable
- Biofortification is a promising new intervention for micronutrient malnutrition that can be quite effective for vulnerable populations, especially in combination with other interventions
- Biofortification involves the development and distribution of new staple crop varieties with higher micronutrient levels than traditional varieties
- The crops discussed in this program are all the product of *selective breeding* (i.e., natural reproduction) and are not GMOs

2.4 Adaptations

Most of the explanations, as well as the review and discussion questions, are written with non-expert audience in mind. For target audiences who are nutritionists, doctors or other subject-matter experts, the materials can be rewritten or condensed.



Unit 3 - Developing Biofortified Crops

3.1 Objectives

By the end of this unit, participants should be able to:

- Explain how the Biofortification Priority Index (BPI) helps researchers prioritize development of biofortified crops
- Summarize how micronutrient targets are set for biofortified varieties
- List causes for micronutrient losses
- Describe the characteristics that make a variety appealing to farmers and consumers
- Outline the major stages of the breeding process
- Explain why breeders might ‘fast-track’ the release of certain varieties

3.2 Synopsis

This unit reviews the process for developing biofortified crop varieties including selecting promising crops and countries using the Biofortification Priority Index, setting nutritional targets and the steps involved in breeding and testing new varieties.

3.3 Key Points

- The Biofortification Priority Index supports data-driven decision making about which crops to develop for which countries
- Nutritional targets are set based on the needs of women and children – the most vulnerable groups – and must account for micronutrients lost during storage, processing and/or preparation
- Breeders must also account for agronomic qualities and consumer preferences
- Selectively breeding varieties with the desired traits involves years of work, developing “parent” lines, testing their nutrient content in the lab as well as their performance in the field
- Breeders might “fast track” release of promising varieties that do not fully meet the targets, in order to help vulnerable populations benefit from biofortified crops sooner

3.4 Adaptations

It is possible that the brief explanation in the previous unit of how biofortified crops are produced through selective breeding will be sufficient for your audience and it will not necessary to delve into all of the technical detail in this section. Use your best judgment to determine the relevance of this information to your audience, and edit accordingly.



3.5 Activities

Explaining Biofortification (Breakout Groups)

Resources: Flipcharts (1 per group), flipchart markers (5-6 per group)

- Split the audience into several groups (4-8 people per group)
- Introduce the activity: *"Each group is to prepare a one-minute statement that explains the biofortification process to a smallholder farmer or policymaker, who might not be familiar with the concept or the underlying science."*
- Instruct some groups to prepare the one-minute explanation for farmers, and other groups – to policymakers (or other relevant stakeholders).
- *You have 5 min to prepare your statements*
- After the discussion each group is to present their one-minute statement.
- Time permitting, at the end of the exercise, ask: *"Would these statements be different depending on country? Region? What other factors do we need to consider when explaining biofortification? What kind of questions might you expect from these audiences?"*



Unit 4 - Fostering Demand for Biofortified Crops

4.1 Objectives

By the end of this unit participants should be able to:

- Identify key stakeholders for biofortification initiatives
- Differentiate between different seed systems, and summarize the advantages and disadvantages of each for biofortification
- Suggest activities to promote farmer adoption of biofortified crops, particularly for your country/region
- Suggest activities to promote consumer adoption of biofortified crops in your country/region
- Develop promotional messaging for different stakeholders and identify the best channels for reaching audiences in your country/region
- Identify partnering opportunities to promote biofortification in your country/region

4.2 Synopsis

This unit focuses on strategies for supporting the introduction of biofortified crops within a country and influencing farmers, consumers and partner organizations to support biofortified crops.

4.3 Key Points

- Biofortification cannot succeed if farmers do not grow biofortified crops and consumers do not purchase and eat them
- Ensuring a secure seed system is critical (if farmers cannot acquire seeds, they cannot grow biofortified crops): the best way to accomplish this depends on the type of plant and local economy
- Emphasizing the agronomic qualities of biofortified varieties is often an effective way of promoting adoption among farmers
- Consumers generally prefer the sensory qualities of biofortified varieties, and providing them with nutrition information can further increase demand
- There are many possible channels and media for distributing promotional messages, though studies have shown that broadcast media such as radio is often more cost-effective than delivering messaging face-to-face
- Potential partners for promoting biofortified crops include local governments, seed companies, NGOs, multilateral organizations and various participants in the agricultural value chain (e.g., food processors)

4.4 Adaptations

It is possible that participants will want to discuss the specific situation/markets in their particular country or region. If all participants are from the same country or region, then it might be worthwhile to edit the materials to reflect the specifics of that geographic area. If not, then you should probably encourage participants to keep discussions general, and focus on points that would be of interest to all attendees.



4.5 Activities

Promoting to Farmers (Breakout Groups)

Resources: Flipcharts (1 per group), flipchart markers (5-6 per group)

- Divide into groups
- Each group is to prepare a 2-min presentation to a group of farmers to explain the advantages of planting biofortified crop (can be any biofortified crop – we are just talking about generalities, not specifics of any one crop)
- You have 10 minutes
- Once complete, groups will deliver their explanation. Facilitator will play the role of a farmer, and group should be ready to address the farmer's concerns.
- Possible questions for the farmer to ask include:
 - I have other varieties that have performed very well for me for many years. Are you saying I should stop planting them? (*Response sought: No, but we would encourage you to try devoting at least some land to biofortified varieties, and if you like them you can devote more land in the future*)
 - Will I have to buy special fertilizer to grow biofortified crops? (*Response sought: No, you can cultivate them the same way you would cultivate any other variety*)
 - What if people don't like how they taste? (*Response sought: These varieties have all been bred to have excellent sensory qualities, and we will be doing promotion to make consumers aware of the nutritional benefits, which should increase demand*)
 - I tried planting some other [crop] that came from [foreign country] and it just didn't grow very well in my soil. (*Response sought: All of these varieties have been tested extensively in local conditions and have been found to perform very well*)

Biofortification Sensory Test (Whole Class)

Resources: samples of both high-iron (no detectable difference) and PVA (detectable difference) crops – regular and biofortified

- Distribute samples of regular and biofortified crops. Depending on sample availability, distribute individually, in groups or layout samples on a demonstration table and ask participants to gather around the table and examine.
- Ask: *"For which crop(s) could you detect an obvious difference? For which crop(s) were differences not detectable?"*
- Time permitting, ask: *"What might be causing the differences? What are the advantages of having detectable differences between regular and biofortified crops? What are the disadvantages?"*



Cooking with Biofortified Crops (Breakout Groups)

Resources: ingredients for one or more recipes from the participant handout

- Divide into groups
- Each group will prepare a different recipe from the participant handout using biofortified ingredients
 - Refer to the appendix on recipes
- Share with the class and discuss the results

Depending on how much attention the recipes require, you might want to continue the presentation while cooking.

Developing Messages (Breakout Groups)

Resources: Flipchart (one per group), markers (5-6 per group)

- Divide the audience into several groups (4-8 people per group)
- Introduce the activity: "*You need to develop a message explaining biofortification and its advantages to various audiences.*"
- Assign each group to develop one of the following:
 - 30-60 seconds "radio" message
 - One-page pamphlet
 - Series of three SMS messages
- If there are more than 3 groups, further separate groups by target audience, e.g. one group creates a pamphlet targeting farmers, another group creates a one-pager for consumers
- *You have 10 min to create your messages*
- After 10 minutes have each group present their message
- Time permitting, ask: "*What messaging channel would work better for your country/region and why?*"



Unit 5 - Scaling Biofortification

5.1 Objectives

By the end of this unit participants should be able to:

- Describe the major challenges for scaling and anchoring biofortified crops within national food systems
- Recognize the potential impact of policies and regulations on promotion of biofortified crops
- Evaluate the potential to support biofortification through trade
- Summarize the importance of integrating biofortification into international standards

5.2 Synopsis

In this unit we explore long-term strategies for “scaling” and “anchoring” biofortification within national food systems, including the impact of policy, regulations, trade and international standards on the promotion, adoption and sustainability of biofortified crops.

5.3 Key Points

- The introductory phase of intensive promotion and support for biofortified crops is not intended to last forever
- Goal is to achieve sustainability and transfer ownership to local stakeholders
- Creating incentives and supports through policy, regulations, trade and international standards can help to ensure that biofortified crops become permanently anchored within local food systems

5.4 Adaptations

It is possible that participants will want to discuss the specific situation/initiatives/regulations in their particular country or region. If all participants are from the same country or region, then it might be worthwhile to edit the materials to reflect the specifics of that geographic area. If not, then you should probably encourage participants to keep discussions general, and focus on points that would be of interest to all attendees.



5.5 Activities

Labeling (Breakout Groups)

Resources: Flipchart (one per group), markers (5-6 per group)

- Divide the audience into groups of 4-8 people
- Introduce the activity: "*You are responsible for designing a packaging label for biofortified crops.*
The label should:
 - *Convey essential information for consumers as succinctly as possible*
 - *Give a sense of benefits*
 - *Include an appropriate, distinctive symbol*"
- Each group designs a label
- *You have 10 minutes*
- After group discussions, each group is to present their idea for a packaging label
- Time permitting, ask: "*What information have you decided to leave out and why? Do you think it would be helpful if all biofortified crops had a standard label? Why or why not?*"



Unit 6 - Conclusion

Key Points

- Mention any recent developments in the field of biofortification
- Summarize key takeaways from the course
- Refer participants back to the course objectives and any other issues they may have been raised at the beginning of the training and seek feedback on how well the objectives were met
- If appropriate, share your contact details, to allow them to get in touch with you after the training
- Allow at least 15 min for Q&A session at the end
- Collect feedback forms, if appropriate

