

An Introduction to Consumption Monitoring: An Example using Grain Fortification

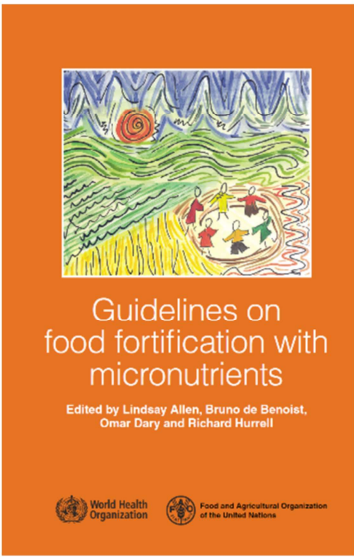


istock photo

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Good morning, I am pleased to give you an introduction to consumption monitoring.



- Monitoring & evaluation system for food fortification programs
- Three components:
 - Internal monitoring
 - Regulatory monitoring
 - Consumption monitoring

WHO/FAO 2006

In 2006, the World Health Organization and FAO published “Guidelines on food fortification with micronutrients”.

In that book, they presented a monitoring and evaluation system for food fortification programs.

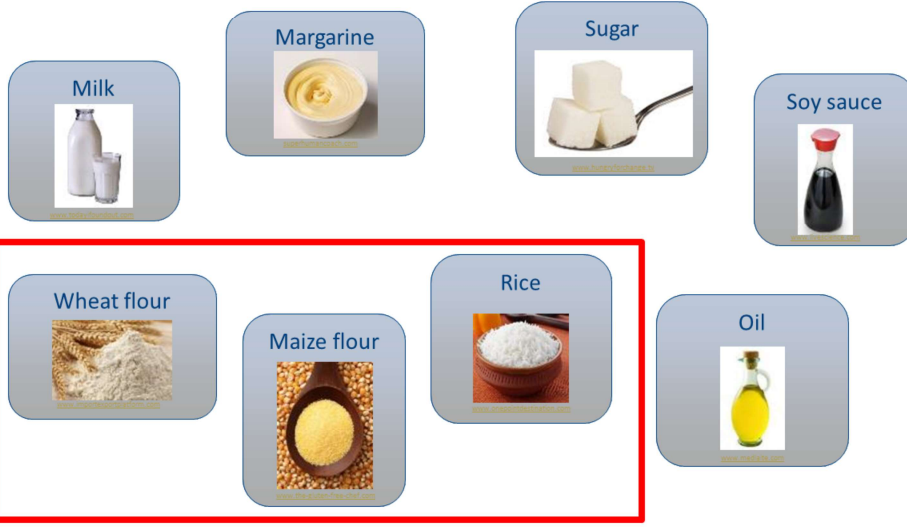
In this presentation, I will describe three components of that monitoring and evaluation system: internal monitoring, regulatory monitoring, and consumption monitoring.

Reference:

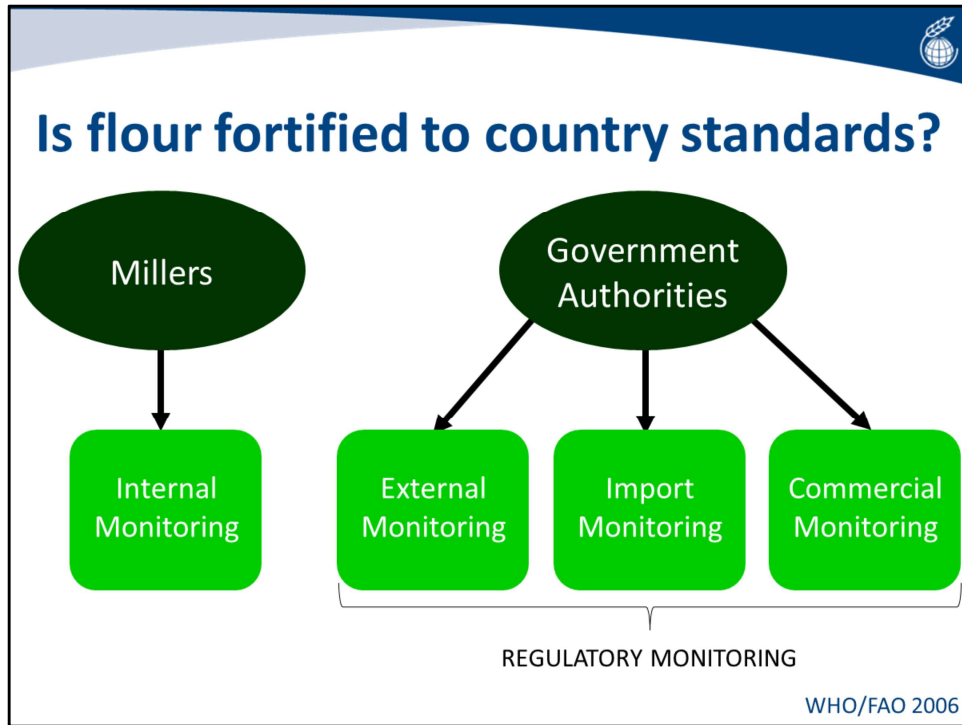
WHO/FAO. Guidelines on food fortification with micronutrients. WHO, 2006.



Examples from grain fortification



Virtually any industrially processed food can be fortified, such as the food shown on this slide. In this presentation, all of the examples I will give are related to grains: wheat flour, maize flour and rice. However, the principles of consumption monitoring apply to any fortified food.



There are two main groups who are responsible for ensuring that flour is fortified to a country's standards: millers and government authorities.

[CLICK TO ADVANCE] Millers complete internal monitoring, while government authorities complete external, import and commercial monitoring. The monitoring done by governments is called regulatory monitoring.

Reference:

WHO/FAO. Guidelines on food fortification with micronutrients. WHO, 2006.

Is the full potential of fortification being realized?

Photo: istock

Population consuming additional vitamins & minerals from bread made with fortified flour

Research Institutions

Government Authorities

Non-governmental Organizations

Consumer-protection Groups

Consumption Monitoring: To assess the potential dietary impact of fortified food

The reason we fortify food, is to increase the vitamins and minerals that people consume.

Are people actually eating as much nutrients from fortified food as we had expected when we planned the program? Have there been changes in people's dietary habits that could affect the impact of fortified food?

These are the kinds of questions we answer with consumption monitoring. If the full potential of fortification is not being realized, then we need to make changes to the program.

[CLICK TO ADVANCE] Consumption monitoring can be completed by different groups, such as government authorities, research institutions, non-governmental organizations, and consumer-protection groups.

Next, I will describe internal monitoring, regulatory monitoring and consumption monitoring in more detail.



Internal monitoring by millers



Checking premix feeder at mill

This is John.

He's the quality control manager at a maize mill.

He's checking the feeder, which is the machine that adds vitamins and minerals to flour.

He's checking to make sure that the feeder dispenses the right amount of vitamins and minerals to the flour.

He will do this at least once per shift every day that fortified maize flour is produced in the mill.

It's just one of the quality procedures that he and other millers follow, to ensure that flour is fortified to the country's standards.

This is an example of internal monitoring by millers.



External monitoring by government authorities



Photo: M. Rao

Reviewing location, label and documentation of vitamin & mineral premix

On the left we have Maya, she's an inspector with the food control authority, who arrived unannounced at the mill.

She is reviewing the location and label of the vitamin and mineral premix stored in the mill's warehouse.

She is also reviewing the mill's documentation that shows that the premix contains all of the nutrients specified in the country standards.

This is an example of external monitoring, which itself is a type of regulatory monitoring.



Import monitoring by government authorities



Photo: www.postalvisien2020.com

Reviewing the paperwork submitted in advance of a shipment of fortified rice entering a country

Customs inspector David is reviewing the paperwork submitted in advance of a shipment of fortified rice entering his country.

He is confirming that the paperwork includes a laboratory certificate indicating that the rice meets the country's fortification standards.

He reviews the paperwork for all shipments of imported rice that enter the country.

This is an example of import monitoring.



Commercial monitoring by government authorities



Photo: David Snyder for the CDC Foundation

Visiting shops, speaking with proprietors, reviewing labels, taking samples

Amos is a food control inspector.

He is visiting shops in the towns that border a country that does not require bread to be made with fortified flour.

Because he is concerned that contraband, unfortified bread is entering his country, Amos visits shops.

He talks with the proprietors about the source of the bread they sell.

He reviews the labels on the bread.

And in some cases, he takes samples of bread for testing in the public health laboratory.

Amos does this to make sure that people living in this border area will eat bread that is fortified to the country's standards.

This is an example of commercial monitoring.



Consumption monitoring by a non-governmental organization




Interviewing Mrs. Diallo about wheat flour and flour-based foods

Salima, at right in this photo, works for a non-governmental organization.

She is interviewing Mrs. Diallo about wheat flour and flour-based foods such as roti and bread.

This is an example of consumption monitoring.



Samples questions asked for consumption monitoring

Section A:

1. What type(s) of flour do you use in your home?
Ask for the brand, producer, flour type (e.g., maida, atta), and source (e.g., store, kiosk, World Food Programme).
If the answer is “no flour is used in the home”, skip to section B.
2. For [the type of flour you most consume], what quantity do you typically use in a day?
3. May I take a sample of this flour? (Yes/No)

Unpublished monitoring manual

To assess consumption monitoring, here is an example of the questions that Salimah asked about the wheat flour the household uses.


Question 1: What types of flour do you use in your home? Here Salimah asked for the brand, producer, flour type and source.

Question 2: For the type of flour most consumed, what quantity do you typically use in a day?

Question 3. May I take a sample of this flour?

Reference:

CDC, GAIN, FFI. Flour fortification monitoring manual. Unpublished.



Samples questions asked for consumption monitoring

Section B:

4. Do you consume [flour-based food] in your home? (Yes/No)
If the answer is no, end the survey.
5. What is the brand and producer name of the [flour-based food] you typically consume in a day?
6. For [flour-based food], what quantity do you typically consume in a day?
7. May I take a sample of this food? (Yes/No)

Unpublished monitoring manual

Mrs. Diallo doesn't buy wheat flour for use in her home, instead, she buys roti made from wheat flour. Thus, Salimah asked her these questions:

Question 4. Do you consume roti in your home?

Question 5. What is the brand and producer name of the roti you typically consume in a day?

Question 6. For roti, what quantity do you typically consume in a day?

Question 7. May I take a sample of this food?

Reference:

CDC, GAIN, FFI. Flour fortification monitoring manual. Unpublished.



What we learn with consumption monitoring

Purpose	Indicator
Fortified flour coverage	Percentage of households consuming fortified flour
Micronutrient provision (or content)	Average additional content of micronutrients in fortifiable flour
Fortifiable flour utilization (or intake)	Average daily intake of fortifiable flour
Micronutrient utilization (or intake)	Average additional amount of micronutrients delivered by consumption of fortifiable flour

Fortifiable flour: flour that by law or standards, should be fortified.

Fortified flour: flour that is confirmed to be fortified through qualitative or quantitative analyses

Unpublished monitoring manual

With the consumption monitoring questions asked in the previous slides, we can calculate these four indicators. On this slide the indicators are specific to flour, but they can be calculated for any fortified food.

They are:

1. The percentage of households consuming flour that is confirmed to be fortified.
2. The average additional content of micronutrients in flour that should be fortified.
3. The average daily intake of flour that should be fortified.
4. The average additional amount of micronutrients delivered by the consumption of flour that should be fortified.

Next, we'll look at an example of how to calculate the fourth indicator, which we call micronutrient utilization or intake. It is calculated with the information gathered for the second and third indicators on this slide.

Reference:

CDC, GAIN, FFI. Flour fortification monitoring manual. Unpublished.



Analysis of micronutrient intake from flour

Regulatory monitoring: 2013, 2014, 2015

- External monitoring: zinc concentration in maize flour samples taken from mills (mg/kg)



Consumption monitoring: 2010

- HIES: Apparent consumption of maize flour (grams/capita/day)



HIES, Household Income and Expenditures Survey

Here's a fictitious example of how micronutrient intake from fortified flour is calculated.

In this example, regulatory monitoring data were collected annually from 2013 through 2015. Specifically, from external monitoring visits to mills, food control inspectors took maize flour samples and had them analyzed in the public health laboratory for zinc.

A household income and expenditures survey was conducted in the country in 2010 by the Ministry of Finance. This information was used to get the apparent consumption of maize flour in grams per capita per day.



Analysis of micronutrient intake from flour

	Household		
	1	2	3
Apparent consumption, maize flour, 2010 (g/c/d)	118	89	106
2013: 24	2.8	2.1	2.5
2014: 29	3.4	2.6	3.1
2015: 30	3.5	2.7	3.2
Zinc, fortified maize flour (mg/kg)	Apparent consumption, zinc from fortified maize flour (mg/c/d)		

Calculation: $118 \text{ grams/capita/day} * 24 \text{ mg/kg} * 1 \text{ kg}/1000 \text{ g} = 2.8 \text{ mg/capita/day}$

Here we have results for three of the households interviewed in the HIES survey. In 2010, the apparent consumption of maize flour was 118, 89 and 106 grams per capita per day for households 1, 2 and 3, respectively.

[CLICK TO ADVANCE] The samples taken from the maize mills in 2013 had an average zinc content of 24 mg/kg of maize flour. In 2014 and 2015, the samples had an average content of 29 and 30 mg/kg, respectively.

[CLICK TO ADVANCE] The apparent consumption of maize flour, multiplied by the zinc content of flour and divided by 1000, yields the apparent consumption of zinc from flour, expressed in milligrams per capita per day. We see that in 2013 in household 1, 2.8 mg of zinc from fortified maize was consumed per capita per day.



Interpreting and using consumption monitoring data

- How do the results compare to goals?
- Should adjustments be made to the country standards, internal monitoring, regulatory monitoring, or other?
- If there are baseline data, is the time right to complete an impact evaluation of the program?

What do we do with the information we calculated in the previous slide? First, we should compare it to goals established for the program.

If the results do not meet program goals, then the food fortification program should be strengthened. That can mean making adjustments to the country standards, internal monitoring procedures, regulatory monitoring procedures and other changes.

Additionally, after looking at consumption monitoring results for several years, you will see if the trends suggest that the target population is consistently getting an important contribution of micronutrients from the fortified food. If so, then it may be the right time to complete an impact evaluation of the program. A traditional impact evaluation can only be completed if there are baseline data available from before the time fortification began.



Summary

Consumption monitoring

1. Assesses the potential dietary impact of fortified food
2. Is different from internal monitoring and regulatory monitoring
3. Can use information from regulatory monitoring to calculate indicators
4. Results should be used to strengthen the fortification program
5. Results can be used to determine if an impact evaluation should be completed

In summary, consumption monitoring assesses the potential dietary impact of fortified food.

It is different from internal monitoring and regulatory monitoring.

That being said, information from regulatory monitoring can be used to calculate consumption monitoring indicators.

Most importantly, the results from consumption monitoring should be used to strengthen the fortification program.

They can also be used to determine if the time is right to conduct an impact evaluation.

For more information:

www.FFInetwork.org

[www.Facebook.com/FFInetwork](https://www.facebook.com/FFInetwork)

<https://twitter.com/FFInetwork>

Join the Food Fortification Initiative group on [Linked In](#)



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Enhancing Grains for Healthier Lives

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Thank you.