

### Quantitative test procedure for small-scale mill fortification

All samples will be sent to a GAIN certified laboratory to perform a quantitative analysis assessing the uniformity/homogeneity of the fortification.

#### Test procedure is as follows:

- a. **10 batches** (or "hoppers") of 1 bucket (~18kg) of grain will be milled/fortified separately.
- b. From each batch, **6 individual samples** of fortified flour will be collected post mill (*sample collection procedure is described later*)
- c. So, there will be a total of **60 samples** (300g each) of fortified flour collected.

In addition to the above, we will need to collect the following samples BEFORE the fortification:

- a. Six samples of whole grain (non-milled Maize) will be collected to determine the native nutrient content (i.e. our **control #1**).
- b. Additionally, before the "contamination" of the mill by the fortificant, 1 bucket (~18kg) of grain will need to be milled without fortification. 6 samples will be collected (sample collection procedure is described below). This will provide us with information about the nutrient content in the unfortified milled flour (i.e. our **control #2**).

The reason for collecting these unfortified milled flour samples is to determine if the native nutrient content differs from that of the non-milled whole grain samples. This will establish if some iron, for example, has been added into the flour during the milled process, potentially due to the hammer mill's metal components.



### Labeling of samples:

All samples (i.e. 6 whole grain, 6 non-fortified flour and 60 fortified flour, each weighing approximately **300g**) will need to be packed in zip-locked plastic bags and clearly labeled.

Labels will have 4 components: MILL - GRAIN - BATCH - SAMPLE

1. **MILL:** If we are undertaking the trials in more than one mill, then Mill IDs are labeled as A, B, C, etc.
2. **GRAIN:** The second component will represent Grain type, labeled as either C (corn/maize), M (millet), or W (wheat). For Tanzania we will only test Maize (C) since this is what the vast majority (~90%) of small and medium scale mills will consume.
3. **BATCH:** The third component will indicate Batch, numbered 1-10.
4. **SAMPLE:** The last component will indicate Sample, numbered 1-6.

An example label would be A – C – 3 – 1, meaning the first sample from the third batch of fortified Maize flour milled at mill A. All non-fortified flour samples will be labeled as batch "0" (e.g. A - C - 0 - 1). Whole grain samples will be labeled as **Maize 1-6** only.

### Sample collection procedure:

Each batch of grain is fully milled and the flour is collected in a bucket post mill. Once milling is complete, samples are taken from the bucket using a ladle (scoop). Touching the flour with human hands is avoided as much as possible.

Samples are to be taken from the following locations within the collection bucket:

- Sample 1: top surface of the flour near one side of the bucket
- Sample 2: top surface of the flour near the opposite side of the bucket
- Sample 3: three-quarters of the way down the bucket, near one side
- Sample 4: three-quarters of the way down the bucket, near the opposite side
- Sample 5: the middle of the bucket, after the flour has been mixed using the ladle
- Sample 6: the middle of the bucket, after the flour has been mixed again using the ladle

