



13/04/2021 version

*A mix of cereal and legumes pulses is what defines "composite flours",  
Composit flours are "enriched flours".*

***BAMiSA Flour is a fatty composit flour having high protein and energy content***

The composit BAMiSA flour and the malt that goes with it are destined to prepare **Liquefied Concentrated Porridges** (LCPs). LCPs are particularly effective to the growth and good health of young children.

This illustrated document explains how to prepare BAMiSA Flour to community or to family use. Making of the flour can be done in 'Artisanal Production Units' (APU) as by 'Community Manufacturing Groups' (CMG). It can also be done by groups of 'BAMiSA Mothers' or home- made.

To manufacture BAMiSA flour, successively :

|   |  |
|---|--|
| <p><b>Collect the ingredients,</b></p> <p><b>Prepare the grain,</b></p> <p><b>Roast the grain,</b></p> <p><b>Make the flour,</b></p> <p><b>Make the malt,</b></p> <p><b>Package the flour and malt,</b></p> | <p><b>Pearl Millet</b> (or Maize), <b>Soybeans, Peanuts, Sugar and iodized Salt,</b></p> <p>using traditional methods,</p> <p>quality deciding step,</p> <p>according to "621 formula", with clean and rigorous method,</p> <p>Cf. Document 04 which illustrate malt making.</p> <p>as soon as they are ready.</p> |
|---|--|

This manufacturing is within everybody's reach and capability. It is achieved in about twenty steps.

The Document 03c "Manufacturing of flour for young children BAMiSA"  
on [www.bamisagora.org](http://www.bamisagora.org) specifies the method of manufacture.



**1° - Collect the ingredients -**

**Choose good quality products**

**Pearl Millet**



**Or, if not, Maize**



**Soybeans**



**Peanuts**



**Sugar**



**Iodized Salt**





2° **- Collect the ingredients -** Determine needed quantities

to manufacture, for example, **10 Kg of flour** (20 bags of 500 g each) :

| You must plan to use  | to obtain   |
|---|---|
| About <b>8 Kg of Pearl Millet</b><br>(or of <b>Maize grain</b> or corn kernels) | <b>6 kg of roasted Pearl Millet</b><br>(or <b>6 Kg of roasted Maize</b> ) |
| About <b>3 Kg of Soybeans</b>   | <b>2 Kg of roasted Soybeans</b>   |
| A bit more than <b>1 kg of skinned Peanuts</b>                                  | <b>1 Kg of roasted Peanuts</b>  |
| A box of <b>1 Kg of Sugar</b> ,<br>( <b>twenty 5g sugar cubes</b> taken off)    | <b>900 g of Sugar</b>   |
| <b>4 to 5 level tablespoonfuls of Iodized Salt</b>                              | <b>less than 100 g of Iodized Salt</b>                                    |

The chart at end of document, page 22, gives more precise quantities to be planned.



3° - Prepare the grain -

**Winnow the Pearl Millet (or the maize) and Soybeans**



*Fada N'Gourma Burkina Faso*

**Grain winnowing, eliminates dust and light debris.**





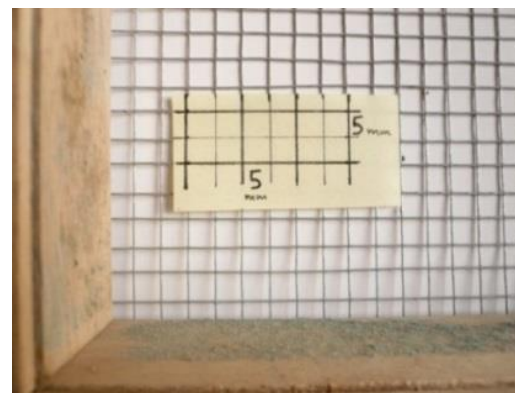
## 4° - Prepare the grain -

## Sieve Soybeans



Tambacounda Sé-

négal 2013



**Holes or mesh : 4 or 5 mm  
in Ø  
to calibrate the soy and elimi-  
nate the small grain**



**Sieving**  
enables to eliminate the grain which is too small  
and therefore gain time.



## 5° - Prepare the grain - Wash the Pearl Millet (or the maize) and Soybeans



Ouagadougou Burkina Fas

**The Washing process** enables the elimination of sand, pebbles, adhering dust and the empty grains which float.





## 6° - Prepare the grain - Drain the Pearl Millet (or the maize) and Soybeans

Thorough draining enables quicker drying process



Tambacounda

Sénégal



N'Djaména Tchad



N'Djaména Tchad

**Draining** in a basket or on a woven mat or in a woven bag.





7° - Prepare the grain -

**Dry the Pearl Millet (or the Maize) and Soybeans**



Burkina Faso



Tambacounda Sénégal  
2013

**Dry in the sun.**

During the Rain Season, it is possible to roast the grain directly after having thoroughly drained it, without drying.







## 8° - Prepare the grain -

## Sort out the peanuts, (the Maize), Soybeans



Sarh

Tchad 2007

**Careful sorting of peanuts**  
To eliminate beans blackened  
by aflatoxins.



Fada N'Gourma Burkina

Faso 2010

**And sorting of the Soybeans**  
(and of the maize)  
To take out the damaged grains.





# 9° - Roast the grain - Roast the Pearl Millet (or the maize), Soybeans and peanuts



Fada

N'Gourma Burkina

**Roast** in cooking drum, bak-  
ingbarrel, cauldron or pan.  
Enables dehydration, pre-cooks  
the grain and sterilizes them



Niamey Niger



Fada N'Gourma





## 10° - Make the flour - - Work in the cleanest possible conditions

The various steps which follow the roasting must avoid contamination by bacteria or dust.



Fada N'Gorma Burkina

Faso 2004

**Cool the grain after roasting.**  
Spread it out on a clean surface  
or winnow it.



Douchi Ni-

ger 2006

**Washing hands** and all the devices which are to be  
used (basins, spoons, grinder,...)  
enables to keep the flour clean



# 11° - Make the flour - Skin the roasted peanut and soybeans

## Skinning the nuts and beans lessen the losses during final sieving.



Dagana Sé-

négal 2013

**Skinning of roasted soy,**  
can be done :

with a grinder, the disks of which have been set wider apart  
or with a hand mill  
or with a hammer grinder with the adequate grid (big holes)



Podor Sénégal

2013



Thiès Sénégal 2013



Sarh

Tchad 2010

**Manual skinning of the  
roasted peanuts,**  
if winnowing  
does not suffice.





# 12° - Make the flour - Winnow and sort out soybeans and peanuts with care, once again.



Fada N'Gourma Burkina

Faso 2005

**Winnowing**  
enables to eliminate hull and skin



Fada N'Gourma Burkina Fa-



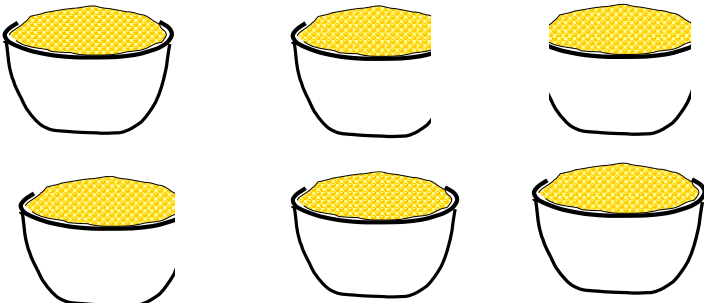




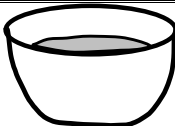

so 2010

**Sorting**  
enables to eliminate burnt nuts, beans.



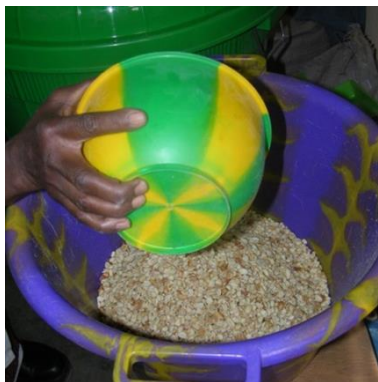
**13° - Make the flour -** Weigh or measure the « 621 » proportions for the mix.



|  |  | .. in <b>VOLUMES</b>                 | .. or   | <b>Weigh</b>   |
|--|--|--------------------------------------|---|----------------|
| <b>Pearl millet</b><br> | <b>Or Maize</b><br> | <b>6 vol.</b><br>of roasted<br>grain |    | <b>60 %</b>    |
| <b>Soybeans</b><br>     |  | <b>+ 2 vol.</b> of<br>roasted beans  |    | <b>20 %</b>    |
| <b>Peanuts</b><br>     |  | <b>1 vol.</b><br>of roasted nuts     |   | <b>10 %</b>    |
| <b>Sugar</b>   |  | <b>+ 1/2 vol.</b>                    |  | <b>9 %</b>     |
| <b>Iodized salt</b>  |  | <b>+ a small quantity</b>            |  | <b>&lt; 1%</b> |



**14° - Make the flour -** **Mix all together the pearl millet (or the maize), soybeans,peanuts, sugar and iodized salt.**



Fada N'Gourma 2005

**Mixing** is achieved according to proportions in volume or weight.



Fada N'Gourma 2005

Mix salt and sugar together, than mix in all the other ingredients.





**15° - Make the flour -**

**16°**

**Grind the mix,**

**Sieve the flour**



Dagana Sénégal 2013

**Finely grind the mix  
in the mill**



Fada N'Gourma Burkina Faso 2005

**Sieve immediately  
in order to cool the flour,  
remove the bran and complete the mixing**







**17° - Package the flour and malt –** *(for Artisanal Production Units)*

**Put the flour in strong plastic bags, weigh 500g and seal.**



Fada N'Gourma Burkina Faso 2010

**On a Roberval scale**



**Or an electronic scale**



Fada N'Gourma Burkina Faso 2010

**Air-tight sealing with a bag welder**

**Write on the bags the place and date of production.**



**18° - Package the flour and malt –** *(for Artisanal Production Units)*

**Place Malt at the top of the bags of flour.**



**Place the malt in small pouches to make it easy to use.**



**Place the small pouch at the top of the flour bag, then seal a second time. Or at the top of the pails**

**Document 04a explain how to prepare the malt**



**19° - Package the flour and malt –**

*(for Artisanal Production Units)*

**Use the normalized BAMiSA® bags**



**Normalized bags are distributed by the network of BAMiSA APUs**



Tambacounda Sénégal 2013

**Store the bags with care in air-tight containers.**



**20° - Package the flour and malt –**

*For Community Manufacturing Groups*

**Package the flour in small pails**



**Put the flour in small pails with the bag of malt placed at the top.**



NIAMEY 2016

**The mothers package the flour in pails which belong to them.**

## RECAP CHART OF THE PROCESS STEPS IN THE MAKING OF THE BAMiSA FLOUR

|                                   |                |  |   |  |  |                         |
|-----------------------------------|----------------|--|---|--|--|-------------------------|
| <b>Gather<br/>Ingrédients</b>     | <b>1<br/>2</b> | <b>Pearl Millet (or Maize)</b>   | <b>Soyebean</b>                                 | <b>Peanut</b>                                  | <b>Sugar</b>                                     | <b>Iodized<br/>salt</b> |
| <b>Prepare<br/>grain</b>          | <b>3<br/>4</b> | Winnow   | Sieve - Calibrate                               |  |  |                         |
|                                   | <b>5</b>       | Wash   |   |  |  |                         |
|                                   | <b>6</b>       | Drain  |   |  |  |                         |
|                                   | <b>7</b>       | Or dry   |   |  |  |                         |
|                                   | <b>8</b>       | Sort   |   | Remove nuts<br>stained with black              |  |                         |
| <b>Roast grain</b>                | <b>9</b>       | Roast and cool   |   |  |  |                         |
| <b>Make<br/>the<br/>flour</b>     | <b>10</b>      | Give special attention to cleanliness when working   |   |  |  |                         |
|                                   | <b>11</b>      |  | Skin  |  |  |                         |
|                                   | <b>12</b>      | Winnow / Shorting  |   |  |  |                         |
|                                   |                | Take out the burnt<br>Corn kernel  | Take out the<br>burnt beans                     | Take out the<br>burnt nuts                     |  |                         |
|                                   | <b>13</b>      | Measure <b>6</b> volumes,<br>or weigh <b>60%</b>   | Measure <b>2</b> volumes<br>Or weigh <b>20%</b> | Measure <b>1</b> volume<br>Or weigh <b>10%</b> | Measure $\frac{1}{2}$ v<br>Ou weigh <b>9,5 %</b> | Measure<br>0,5 % to 1 % |
|                                   | <b>14</b>      | Mix salt ans sugar, then mix everything together with care                                 |   |  |  |                         |
|                                   | <b>15</b>      | Grind finely   |   |  |  |                         |
| <b>16</b>                         | Sieve          |  |   |  |  |                         |
| <b>Package flour<br/>and malt</b> | <b>17</b>      | Package in bags and seal airtight  |   |  |  |                         |
|                                   | <b>18</b>      | Package malt in small bags and add them at the top of the flour bags, then seal airtight   |   |  |  |                         |
|                                   | <b>19</b>      | For the APUs : normalized BAMiSA® packaging  |   |  |  |                         |
|                                   | <b>20</b>      | For the CMGs, the MBB (Maquis Bébé), the flour and the malt are conditioned in small pails |   |  |  |                         |

## Making of the BAMiSA flour

### Chart of ingredient quantities to be prepared for the " 621 "mixture and and for the malt.

This chart shows the **quantities required for each ingredient** necessary in the making of the flour, according to the quantity of flour that you want to produce : 10, 25 or 50 Kg. (For the cereal and (legumes) pulses, we are dealing here with ingredients which have been roasted).

This chart also enables to know how much **raw cereal and (legumes) pulses are needed**. Depending on their quality, the quantities of raw ingredient might be majored or minored. The quantities here are thus approximate (~).

| <b>Quantity of Flour that you wish to obtain in Kg</b><br>or number of bags containing 500 grammes   |                           |                           |                            |                           |
|--|---------------------------|---------------------------|----------------------------|---------------------------|
| <b>10 Kg</b><br>20 b.  | <b>25 Kg</b><br>50 b.     | <b>50 Kg</b><br>100 b.    | <b>1 Tonne</b><br>2 000 b. |                           |
| <b><u>Weight of processed ingredients<br/>necessary for the mix</u></b><br><i>And estimation of the weight of the raw in-<br/>gredients.</i> |                           |                           |                            |                           |
| <b>Pearl Millet or roasted<br/>Maize Raw Grain</b><br>( ≈ 1/4 of residue )   | <b>6 Kg</b><br>~ 8 Kg     | <b>15 Kg</b><br>~ 20 Kg   | <b>30 Kg</b><br>~ 40 Kg    | <b>600 Kg</b><br>~ 800 Kg |
| <b>Roasted Soybeans</b><br><i>Raw soy</i><br>( ≈ 1/3 of residue )  | <b>2 Kg</b><br>~ 3,2 Kg   | <b>5 Kg</b><br>~ 8 Kg     | <b>10 Kg</b><br>~ 16 Kg    | <b>200 Kg</b><br>~ 320 Kg |
| <b>Roasted peanuts</b><br><i>Raw peanuts</i><br>( ≈ 1/10 of residue )  | <b>1 Kg</b><br>~ 1,1 Kg   | <b>2,5 Kg</b><br>~ 2,7 Kg | <b>5 Kg</b><br>~ 5,5 Kg    | <b>100 kg</b><br>~ 110 Kg |
| <b>Sugar</b>   | <b>0,900<br/>Kg</b>       | <b>2,250<br/>Kg</b>       | <b>4,500<br/>Kg</b>        | <b>90 Kg</b>              |
| <b>Iodized salt</b>  | <b>≤ 100 g</b>            | <b>≤ 250g</b>             | <b>≤ 500 g</b>             | <b>&lt; 10 Kg</b>         |
| <b><u>Weight of the processed grain necessary<br/>for the preparation of the malt</u></b><br><i>Estimated weight of the raw grain</i>        |                           |                           |                            |                           |
| <b>Sieved Malt</b><br><i>Grains of Sorgho, Maize,<br/>Pearl Millet,...to prepare<br/>the malt.</i><br>( ≈ 1/2 of residue )                   | <b>0,2 Kg</b><br>~ 0,4 Kg | <b>0,5 Kg</b><br>~ 1 Kg   | <b>1 Kg</b><br>~ 2 Kg      | <b>20 kg</b><br>~ 40 Kg   |

This chart also enables to figure out the evaluation of the **stocks of raw ingredients to be planned** for the bigger orders.