

The Liquefied Concentrated Porridge Concept (LCP Concept)

28/ 05 /2021 Version

The LCP concept is based on the use of **local amylases** which, once **added to the warm, thick porridge**, enables its **liquefaction**. Indeed, the « Malt for the porridge », or the mother's milk or saliva, very rich in amylases, can be used to liquefy thick porridges. This avoids the disastrous **dilutions** with water.

The LCP concept is based upon the respect of **the specific physiology of young children** :

- High protein and energy needs,
- Small gastric volume which does not enable to eat big quantities at meals,
- Oral-digestive immaturity which does not enable to eat any type of food.

The LCP concept thus enables to prepare porridges for young children which **conciliate high protein-energy density** with **low viscosity** for young children, according to the WHO and UNICEF * requirements.

The LCP concept highlights the 'porridge' attributes. Indeed, young children **don't eat flour ! They eat porridge.**

- The nutritional quality of a porridge is mainly determined by the **amount of flour it contains, i.e. by the flour/water ratio**. In LCPs this proportion reaches **30%** while for most of the standard or improved porridges, this proportion is of only 8 to 15%. The LCPs are therefore "**concentrated**" in flour. (More precisely, this quality standard is defined by the quantity of dry matter per 100 grams of porridge when consumed (grs of DM/100grs).
- The BCLs are prepared with 2/3 cereals (or dried tubers) and 1/3 fatty legumes. Therefore, BCLs are blended porridges.
- Therefore, the nutritional quality of a porridge is not determined by the sole **quality of the flour** that is used, be it "improved", "enriched", "blended", "fortified", amylased, malted, pre-cooked, extruded or from an imported brand.
- Therefore, the nutritional value of a porridge is not correlated to its consistency.

The LCP concept is a solution which is « **simple, local, autonomous, reproducible everywhere, economically viable, sustainable and having low carbon imprint** », which addresses the issue of child malnutrition, as far as these are related to the consumption of porridges having weak nutritional value. LCPs are an alternative to industrial food used to fight against malnutrition.

The LCP concept thus meets the characteristics of the "**ideal supplementing porridge**" ** edicted in 1991, at the ORSTOM/IRD Conference in Brazzaville.

The LCP concept participates in the **nutritional education**.

The LCP concept also has a **social-economic dimension**. It respects:

« Peoples' rights to feed themselves »
« The rights of families to feed their children themselves »

The BAMiSA porridge is an example of Liquefied Concentrated Porridge.

Notes

* Concerning WHO/UNICEF recommendations:

WHO/UNICEF recommend that the porridge fed to young children should reach 100 to 120 Kcal/100 ml without their consistency being an obstacle to their **rapid** and **total** consumption. Their flow rate should therefore be superior or equal to 60 mm/30 sec (or their viscosity be inferior to 1,600 centipoises, or inferior to 1.6 Pascal/sec).

** Concerning the "ideal complementary porridge"

The « ideal complementary porridge »:

- Comes as a **complement** to maternal milk,
- Brings, along with the maternal milk, all of the **nutriments** necessary to the growth and development of children between 6 months and two years of age,
- Takes the mother's **habits** into account,
- Is made from **local produce**,
- is **easy** (and quick) to ingest, entirely
- is **easy** to digest,
- Is **easy** and **quick** to cook
- Is **affordable**.

And to prepare this porridge the author adds:

" It is possible to "liquefy" porridge by adding small amounts of amylase-rich flour [...]: Porridge made of 30% dry matter liquefies instantly and its energy density reaches 1 Kcal per gramme of porridge."

JC Dillon, Caractéristiques attendues d'un aliment de complément à l'allaitement.
Séminaire-Atelier sur les bouillies de sevrage en Afrique Centrale,
ORSTOM (IRD) - Brazzaville, 21-24 May 1991

Bibliography concerning the malt added to the porridge

As early as **1983**, Mosha and Svanberg successfully experiment the liquefaction of thick porridges thanks to germinated cereal (which they called Power Flour). [Mosha A.C., Svanberg U. *Preparation of weaning foods with high nutrient density using flour of germinated cereals*. Food and Nutrition Bulletin vol 5, p 10 - 14, **1983**].

In **1988**, Gopaldas blended what he called "Amylase-Rich Food" (ARF) into the porridge and wrote: « *Low-bulk, high-energy wheat porridges can be prepared by just adding a pinch of ARF to a big cup of hot cooked porridge* ». [Gopaldas T et coll. *Studies on a wheat-based amylase-rich food*. Food and Nutrition Bulletin vol 10 N°3, p 77, **1988**].

In **1991**, this solution was taken up by Dillon again. [Dillon JC, INA.PG. *Qualités nutritionnelles attendues d'un aliment de sevrage*. Séminaire-Atelier sur les bouillies de sevrage en Afrique Centrale, ORSTOM (IRD) - Brazzaville, 21-24 mai **1991**].

The participants in the Misola Project started using local amylases in the porridge as early as the 1990's. This process materialized in 2009 with the "1+2+3 BAMiSA Recipe" (1 volume of flour + two volumes of water + 3 pinches of malt).

NB. The direct adjunction of malt to the porridge must be distinguished from the prior blending of malted flours to standard flours. This process, which reduces the viscosity of porridges and which is traditionally used by some, is more scientifically documented than the direct adjunction of malt into the porridge. See Document 10a "Bibliography" of this site.

The problem raised by the thickening of porridges before their nutritional value is sufficient (dietary bulk) is solved, in a simple way, by the adjunction of a local amylase in the hot porridge. Even though this solution was validated as early as 1983, it did not attract the attention of the programmes fighting against malnutrition. Why is this solution absent from the Nutritional Education Programmes ?

