

Institut de Recherche pour le Développement (IRD),

UMR 204 « Nutrition et Alimentation des Populations aux Suds » (NUTRIPASS), Montpellier, France.

\*: fabien.saubade@ird.fr

# Influence of spontaneous fermentations on the folate content of a pearl-millet based gruel

Fabien Saubade\*, Youna Hemery, Jean-Pierre Guyot & Christèle Humblot

### Introduction

Folate (vitamin B9) deficiencies can lead to health disorders such as megaloblastic anemia and neural tube defects. Ben-saalga is a traditional african cereal based gruel, mainly fermented by lactic acid bacteria. This gruel is often used as complementary food for

### **Material and Methods**

Ben-saalga samples (n=50) were collected in 10 traditional production units (TPU, coded with letters from A to J) in Ouagadougou (Burkina Faso).



young children in Burkina Faso, but its folate content was unknown.

Aim of the study: This study was planned to measure the folate content of ben-saalga and to assess the relationship between the folate content and the natural microbiota of this gruel.

- 1. Total folate assay (Kariluoto, 2009)
- 2. Screening of two signature genes for folate biosynthesis by PCR (Turpin et al., 2011)
- 3. Quantification of lactic acid bacteria (LAB) by real time PCR



The folate content of ben-saalga is low, given that young children should eat 160 µg of folate/day. The expected theoretical value (2.6  $\mu$ g/100g FM) was calculated from the folate content of the whole grain, making the hypothesis that no folate was lost during the process. So, we observe that folate is generally lost during the process, but a folate

production can sometimes be observed. Folate might be synthesized by microorganisms during the fermentation step.



Both signature genes *folP* and *folK* were detected in 46% of the metagenomes. This suggests that the microbiota of bensaalga has a good potential to synthesize folate. However, there are no significant correlations between the detection of the two genes and the folate content of the samples.



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### Α R C D G H **Traditional production units**

### Fig. 3: real time PCR quantification of Lactobacillus plantarum, L. fermentum, Leuconostoc and Weissella

The microorganisms concentrations of gruels produced by different TPU are significantly different, even if there is a high variability between samples from the same TPU. However, no significant correlation was observed between the microorganisms concentrations and the folate content of the samples.

## Conclusion

In spite of a good genetic potential of the lactic acid bacteria naturally present, the folate content of ben-saalga is very low for a complementary food. The influence of the different process steps (and especially the fermentation duration) on folate content of this pearl-millet gruel will be investigated in an other study. It will allow us to better understand the relationship between the folate content and the microbiota.