

## SUPPLEMENTARY INFORMATION

### **Comparison of the microbial composition of African fermented foods using amplicon sequencing**

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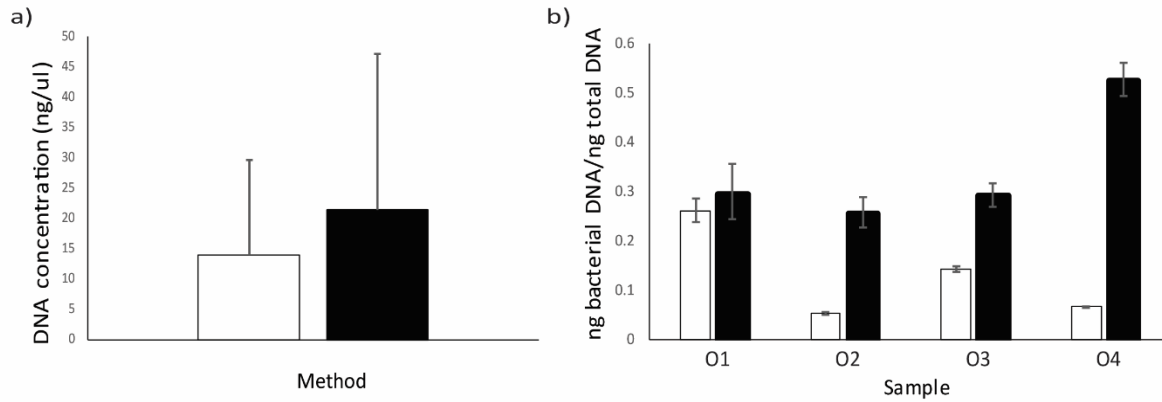
48 **Supplementary Table S1.** Number of reads per sample after each filtering step.

| Sample code | Sequence count | filtered | denoised | merged | non-chimeric | non-background DNA |
|-------------|----------------|----------|----------|--------|--------------|--------------------|
| S1          | 80091          | 72462    | 72462    | 71119  | 68837        | 68748              |
| S2          | 84950          | 78859    | 78859    | 75296  | 60689        | 50148              |
| S3          | 93400          | 87568    | 87568    | 84947  | 73746        | 73473              |
| S4          | 84943          | 79578    | 79578    | 77385  | 67803        | 67649              |
| S5          | 95390          | 89632    | 89632    | 87139  | 77171        | 76528              |
| S6          | 90807          | 85735    | 85735    | 83411  | 72911        | 72451              |
| S7          | 98320          | 92551    | 92551    | 89414  | 77812        | 75867              |
| S8          | 92091          | 86995    | 86995    | 84235  | 72999        | 71192              |
| S9          | 95647          | 88130    | 88130    | 84908  | 73625        | 72575              |
| S10         | 96998          | 91385    | 91385    | 88836  | 77144        | 76962              |
| S11         | 99396          | 91135    | 91135    | 88514  | 80812        | 46726              |
| S12         | 86183          | 80750    | 80750    | 78297  | 70151        | 69974              |
| S13         | 98058          | 91233    | 91233    | 88430  | 78064        | 77855              |
| S14         | 97558          | 90451    | 90451    | 87434  | 82066        | 81789              |
| S15         | 92134          | 86234    | 86234    | 83760  | 75757        | 75585              |
| S16         | 98029          | 91910    | 91910    | 89317  | 82595        | 82576              |
| S17         | 88221          | 82590    | 82590    | 80028  | 73782        | 73764              |
| S18         | 86346          | 81540    | 81540    | 79446  | 72808        | 72803              |
| S19         | 87116          | 81919    | 81919    | 79728  | 75074        | 75054              |
| S20         | 80342          | 75610    | 75610    | 73272  | 67397        | 67362              |
| S21         | 92292          | 86936    | 86936    | 84406  | 77573        | 77569              |
| S22         | 90615          | 83988    | 83988    | 82171  | 78836        | 78825              |
| S23         | 86554          | 80557    | 80557    | 78977  | 74448        | 74249              |
| S24         | 81200          | 76069    | 76069    | 73354  | 68590        | 68590              |
| S25         | 80686          | 75272    | 75272    | 73095  | 67793        | 67790              |
| S27         | 80979          | 76837    | 76837    | 74254  | 69855        | 68032              |
| S28         | 97441          | 92379    | 92379    | 88465  | 80147        | 80080              |
| S29         | 89653          | 84386    | 84386    | 81697  | 75908        | 75859              |
| S30         | 88070          | 83893    | 83893    | 81143  | 75354        | 75312              |
| S31         | 99925          | 95544    | 95544    | 92248  | 86427        | 86387              |
| S32         | 84162          | 80323    | 80323    | 78495  | 75257        | 75194              |
| S33         | 89739          | 85444    | 85444    | 82499  | 77529        | 77402              |
| S34         | 82868          | 79047    | 79047    | 77380  | 74696        | 74379              |
| S35         | 93484          | 87636    | 87636    | 85001  | 78887        | 78257              |
| S36         | 86226          | 82264    | 82264    | 79919  | 73367        | 72013              |
| S37         | 91450          | 86776    | 86776    | 84202  | 80161        | 79629              |
| S38         | 80534          | 76494    | 76494    | 74267  | 71266        | 70931              |

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**Supplementary Figure S1.** Comparison of DNA yielded by extraction methods M1 (white bars) and M2 (black bars). a) Mean and standard deviation of the total DNA concentration (ng/μl) extracted from samples O1 to O4; b) Mean and standard deviation of the ng of bacterial DNA per ng of total DNA extracted per sample.



## Supplementary Methods: Optimization of bacterial DNA extraction yield

In our previous attempts to extract DNA from fermented cereals, very low yields were observed (data not shown). In this study, the FastDNA SPIN Kit for soil, which uses mechanical lysis to break the cells, was used and the effect of a pre-treatment of the sample on the yield of the extraction was tested. DNA was extracted from four cereal-based fermented samples (Supplementary Table S1) using methods M1 (DNA extraction without pre-treatment) and M2 (DNA extraction with pre-treatment).

**Supplementary Table S2.** List of samples used to compare the DNA extraction yield of methods M1 and M2.

| Sample code | Product name | Raw material | Country | Production conditions |
|-------------|--------------|--------------|---------|-----------------------|
| O1          | Maasa        | Millet       | Ghana   | Artisanal             |
| O2          | Maasa        | Millet       | Ghana   | Artisanal             |
| O3          | Kenkey       | Maize        | Ghana   | Artisanal             |
| O4          | Maasa dough  | Millet       | Ghana   | Artisanal             |

67 Total DNA extracted from the fermented samples was quantified fluorometrically by a Qubit 3.0  
68 fluorometer (Invitrogen, Carlsbad, CA) using the Qubit dsDNA BR Assay Kit (Invitrogen), or  
69 the Qubit dsDNA HS Assay Kit (Invitrogen) when the concentration of DNA was  $<10$  ng/ $\mu$ l.  
70 Bacterial DNA was quantified by quantitative PCR (qPCR) of the 16S rRNA gene using a  
71 SensiFAST SYBR No-ROX Kit (Bioline, UK) and a ViiA 7 Real-Time PCR System (Applied  
72 Biosystems, USA). The reaction consisted of 2x SensiFAST SYBR No-ROX Mix, 0.4  $\mu$ M  
73 primers 515F and 806R (Caporaso et al., 2011) and 0.1 ng DNA as template. A calibration curve  
74 ( $R^2 > 0.99$ ) for calculation of bacterial DNA quantity was generated based on gDNA extracted  
75 from *Lactobacillus plantarum* FI11116 (isolated from *ogi*, a traditional fermented maize,  
76 unpublished).

77 Although no statistical differences were found in the total DNA yielded by both methods,  
78 differences were observed in some samples. Method M2 yielded more total DNA in sample O4  
79 than method M1 (58 vs 1.28 ng/ $\mu$ l), and similar yields in samples O2 (1.81 ng/ $\mu$ l vs 1.01 ng/ $\mu$ l)  
80 and O3 (21.2 vs 19.4). Higher DNA yield was obtained with method M1 for sample O1 (33.8 vs  
81 4.04 ng/ $\mu$ l). To check whether the differences between the amount of total DNA extracted with  
82 both methods was due to a change in the amount of bacterial DNA extracted or if it was  
83 background DNA (DNA from the raw materials), qPCR of the bacterial 16S rRNA gene was  
84 performed. A statistically significant increase (p-value= 0.011) was observed in the bacterial  
85 DNA extraction yield of method M2 compared to method M1. As shown in Fig. 1b, method M2  
86 yielded more bacterial DNA per ng of total DNA than method M1 (7.8-fold increase for sample  
87 O4, 4.75-fold increase for sample O2, 2.05-fold for sample O3 and 1.12-fold increase for sample  
88 O1). These results show that method M2 reduces the background DNA from the food matrices.

Method M1 could overestimate the amount of bacterial DNA used when applying  
high-throughput techniques.

**Supplementary Figure S2.** Relative abundance of bacterial community at species level for OTUs within the genus *Lactobacillus*.

