
UNRAVELLING THE IMPACT OF SOURDOUGH FERMENTATIONS ON THE VISCOELASTIC GLUTEN NETWORK AND THE AQUEOUS PHASE IN A WHEAT WHOLEMEAL DOUGH SYSTEM IN RELATION TO GAS CELL STABILITY

A Data Management Plan created using DMPonline.be

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Project abstract:

Food fermentation technology, including the use of sourdough, is increasingly re-examined as a sustainable technology that can improve the nutritional quality of products, next to adding flavour and shelf life. While much progress has been made in recent years concerning the microbial ecology of sourdoughs, a knowledge gap exists concerning the **technofunctionality of sourdoughs in wheat (wholemeal) dough systems**. Therefore, in this project, I aim to gain insight into the effect of sourdough fermentation on the viscoelastic gluten network and dough aqueous phase in a dough system, two defining elements for gas cell stabilisation. **Different microorganisms will be screened** for their effect on the gluten network and the composition of the aqueous phase. Afterwards, specific sourdoughs and individual metabolites will be used to study their functionality in dough systems in-depth. Mechanistic insights into the impact on the **gluten network** will be obtained by analysing the protein structure and dough rheology. The **aqueous phase** will be investigated by isolating dough liquor and studying its composition, viscosity and air-water interfacial properties. The obtained insights will allow to determine the relative contribution of the gluten network and the aqueous phase on the **evolution of the cellular structure** in a dough system. With this project, fundamental insights that are crucial for the controlled incorporation of sourdough in food systems will be obtained.

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FWO DMP (Flemish Standard DMP)

1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
Physicochemical characterisation of sourdough fermentations		New	Digital	Experimental	.xlsx	<1GB	
Microscopy of bread dough		New	Digital	Experimental	.tif	<1TB	
Other analytical results		New	Digital	Experimental	.tif	<1GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

NA

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- No

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- No

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, ...)? If so, please comment per dataset or data type where appropriate.

- Yes

All datasets could be used to generate new insights that could be applied in the baking industry.

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

README files will accompany all datasets as a separate sheet in an excel file or as a .TXT file. This will include the methodology used to collect the data, analytical and procedural information, definitions of variables and units of measurement.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be

used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

DataCite will be used as a metadata standard.

3. Data storage & back-up during the research project

Where will the data be stored?

Data is stored centrally on storage facilities of the research unit and university. Daily back-ups (with a mirror copy) and network maintenance are executed by the ICTS services of KU Leuven. Only specific lab members will have access to the shared folder and large volume storage. Unauthorised persons do not have access to this system.

How will the data be backed up?

Data is stored centrally on storage facilities of the research unit and university. Daily back-ups (with a mirror copy) and network maintenance are executed by the ICTS services of KU Leuven. Only specific lab members will have access to the shared folder and large volume storage. Unauthorised persons do not have access to this system.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely.
If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

Data is stored centrally on storage facilities of the research unit and university. Daily back-ups (with a mirror copy) and network maintenance are executed by the ICTS services of KU Leuven. Only specific lab members will have access to the shared folder and large volume storage. Unauthorised persons do not have access to this system.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

Data is stored centrally on storage facilities of the research unit and university. Daily back-ups (with a mirror copy) and network maintenance are executed by the ICTS services of KU Leuven. Only specific lab members will have access to the shared folder and large volume storage. Unauthorised persons do not have access to this system.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

Internal funding

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

All datasets will be retained for at least 10 years according to KU Leuven RDM policy.

Where will these data be archived (stored and curated for the long-term)?

KU Leuven RDR or FRIS portal

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

NA

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Yes, in an Open Access repository

Data will be shared in an Open access repository (KU Leuven RDR or FRIS portal) with restricted or open access depending on the type of data.

If access is restricted, please specify who will be able to access the data and under what conditions.

Restricted access will be implemented to allow time to publish or seek patents. After publication, all data will be immediately available open access.

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- No

Where will the data be made available? If already known, please provide a repository per dataset or data type.

KU Leuven RDR or FRIS portal

When will the data be made available?

Upon publication of the results

Which data usage licenses are you going to provide? If none, please explain why.

CC-BY

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- Yes

KU Leuven RDR or FRIS portal will assign a DOI number to the datasets

What are the expected costs for data sharing? How will these costs be covered?

The publishing costs will be covered by the host research group. No costs are expected for data sharing.

6. Responsibilities

Who will manage data documentation and metadata during the research project?

Yamina De Bondt

Who will manage data storage and backup during the research project?

Yamina De Bondt

Who will manage data preservation and sharing?

Yamina De Bondt, Christophe Courtin

Who will update and implement this DMP?

Yamina De Bondt