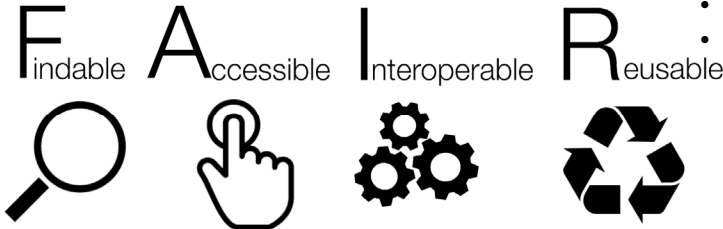


# FAIR data management

Jens G. Hansen, Jørgen Olesen and Camilla Brodam

2016\*



## Outline

- Introduction / Jens
- Data management – Responsible conduct / Jørgen
- Data from published papers / Camilla
- Group work
- FAIR management of data and data flows / Jens
- Group work

FAIR (**F**indable, **A**ccessible, **I**nteroperable and **R**eusable) principles. The purpose of this strategy is to ensure that research data generated via public funds, and possibly co-funded by private research-funding foundations, meet the FAIR principles.

National strategy for data management based on the FAIR principles, August 2021

How to manage data and tools in AGRO based on the FAIR principles!

\*(Wilkinson, M.D. et al. The FAIR Guiding Principles for scientific data management and stewardship. Sci.Data 3:160018 doi:10.1038/2016.18 (2016)

# DATA MANAGEMENT RESPONSIBLE CONDUCT

Professor Jørgen E. Olesen

Danish Code of Conduct for  
Research Integrity

# RESPONSIBLE CONDUCT OF RESEARCH

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1. Research planning and conduct
- 2. Data management**
3. Publication and communication
4. Authorship
5. Collaborative research
6. Conflicts of interest

Responsible conduct of research includes proper management of primary materials and data.

The key purpose of data management is to guarantee credible and transparent research.

# RESPONSIBILITIES

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Primary materials and data should be **retained, stored and managed in a clear and accurate form** that allows the result to be assessed, the procedures to be retraced and – when relevant and applicable – the research to be reproduced.

Data should in general be kept for a period of at least **five years** from the date of publication.

The data records should enable identification of persons having conducted the research and persons or institutions with responsibility for the primary materials, data, and research results.

The data records should contain a precise and traceable reference to the source. Any changes to the primary materials or data stored should be clearly accounted for in a way that allows clear identification of the changes made.

# RESPONSIBILITIES - RESEARCHERS

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Researchers are responsible for storing their primary materials and data.

Researchers are – unless otherwise regulated – responsible for deciding the extent to and duration for which primary material is to be retained.

# RESPONSIBILITIES - INSTITUTION

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Institutions should maintain a policy on the retention of primary materials and data that includes information on:

- a. Storage of primary materials and data
- b. Secure and safe disposal of primary materials and data after the retention period
- c. Responsibility for and access to primary materials and data
- d. Data retention, accessibility and ownership when researchers leave the institution

Institutions are responsible for providing secure data storage facilities that are consistent with confidentiality requirements and applicable regulations and guidelines, e.g. on the processing of personal data.

Institutions should allow access to the stored primary materials and data, except when this is in conflict with contractual legal obligations or current regulations on for example ethical, confidentiality or privacy matters or intellectual property rights.

# DATA FROM PUBLISHED PAPERS

## DATAMANAGEMENT ON THE O-DRIVE

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To ensure that all data obtained in published research projects including PhD and postdoc studies is safely stored and accessible for later use we need to:

- store and secure data from our published papers, so that it can be recovered
- have a practice for how this data is organised, described, structured, and documented
- follow AU's current policy for how data is accessed and possibly shared

# STEP BY STEP

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1. Folders on the O-drive - O:/tech\_AGRO-CROP-data
2. Create a folder with your name or AU-number
3. In this folder create a folder with the Research Project Number
  1. Subfolders like: Manuscript files, Graphics, Experimental Setup, Programs and scripts, Data files and Program files
4. Save your data here

First authors are responsible for archiving

(For further information – see the handout ” *Guide to saving data in AGRO – Step by step*”

# GROUPWORK

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How do we ensure that data is saved correctly? Input to the future procedure

5 min – Individually write down all of your ideas – one idea per post-it

10 min – group discussion – talk about the different ideas and choose the top three ideas and write them on a A5 post-it

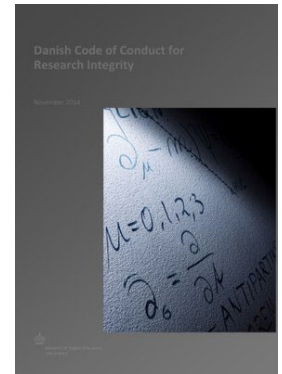
After the group-work we will collect all the post-its, which will be used in the continued data management work

# You must do Research Data Management (RDM)

## Comply with the Danish Code of Conduct for Research Integrity

### A must in EU projects:

- Projects generating research data MUST manage their data responsibly and in line with FAIR principles
- Deposit data in a trusted repository and provide open access through it
- 'as open as possible as closed as necessary', e.g. vi licenses
- Data Management Plan.



## Where to find information

<https://agro.medarbejdere.au.dk/en/project-management/data-management/browse>

### Department of Agroecology - Staff

- > IT
- >> Lab and field experiments
- >> Project management
  - > External funding
  - > File keeping in AGRO
  - > **Data Management**
- > Personnel and hiring
- >> Sections
- >> Committees in AGRO
- > Organisation
- > Department management
- >> Communication
- > AGRO external homepage
- > Corona in AGRO
- > GDPR at work

## Data Management



Data management is all about how you manage your research data before, during, and after your research project. It is important that you handle data responsibly both research, technical, legal, and ethical data. This means that you must:

- > store and secure data so that it can be recovered and so that data loss is prevented
- > have a practice for how data is organised, described, structured, and documented
- > follow AU's current policy for how data is accessed and possibly shared
- > make a Data Management Plan that i.a. contains a plan for how data is preserved or destroyed

[The Danish Code of Integrity in Research](#) (2014) states: "Primary materials and data should be retained, stored and managed in a clear and accurate form that allows the result to be assessed, the procedures to be retraced and – when relevant and applicable – the research to be reproduced."

Data Management is an essential part of good research practice, as it helps to ensure that data can be retrieved and reproduced, just as it helps to verify your research results.

### Do you have any questions?

You can contact the research support unit for further questions.



Read more about classification of data



INSTITUT FOR AGROØKOLOGI – MEDARBEJDERPORTAL

English

AIU > - > Institut for Agroøkologi > Udvalgte i AGRO > Data management udvalg

**agro.medarbejdere.au.dk**

- > IT
- > Laboratorie og Markforsøg
- > Projektstyring
- > Ansættelsesprocedurer og øvrige personaleadministrative ting
- > Anmodning om Ansættelse og Ophold ved Agroøkologi
- > Sektioner
- > Udvalg i AGRO
  - > Institutledelsesmøder
  - > LSU
  - > Institutforum
  - > IAHU
  - > Uddannelsesudvalg
  - > Erhvervsudvalg
  - > Udvalg for MARK-Jylland
  - > **Data management udvalg**
- > For ph.d.-studerende
- > Organisation
- > Institutledelse
- > Kommunikation
- > AGRO eksterne hjemmeside
- > Corona i AGRO
- > Myndighedsbetjening

## Data management udvalg

**Baggrund og reference**  
Udvalget er nedsat af AGRO's institutledelse. Udvalget refererer til institutlederen.

**Sammensætning**  
Hver forskningssektion indstiller et medlem til udvalget for AGRO data management og driftshederne kan også repræsenteres. Udvalget kan suppleres ad hoc efter behov.

**Funktionsperiode**  
2 år ad gangen. Den aktuelle periode er fra 1. august 2021 – 31. juli 2023.

**Overordnet formål**  
Data udgør en meget vigtig og ressourcekrævende del i AGRO, hvorfor en løbende optimering af området er central. Datahåndtering er samtidig en central del af de enkelte forskeres forskningsintegritet og af instituttets generelle forpligtelser. Udvalgets opgave er at understøtte institutledelsen i at sikre, at instituttet lever op til gældende regler for data management, datasikkerhed, GDPR, o.l.

**Opgaver**  
Det er udvalgets opgave at tage initiativer, udarbejde indstillinger og rådgive institutlederen vedrørende data management i AGRO, herunder

- > FAIR principper
  - > Data management plan
  - > Data opbevaring
  - > Platforme til samarbejde og deling af data
- > Data arkivering
- > Årlig gennemgang af instituttets modenhedsvurdering
- > Effektive data strømme

**Forretningsorden**  
Der afholdes minimum 4 møder om året, som indkaldes af formanden/sekretæren.  
Fra alle møder udarbejdes beslutningsreferat, som efter godkendelse placeres på AGRO's intranet.

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## Examples of challenges and opportunities expressed by each section

Section	Challenges	Opportunities
Soil Fertility (JORNÆR)	Data storage and security on O-drive Data flow not effective	New and better equipment in the labs including automated dataflow and data management
Crop health (CROP)	Data are not safe enough using the O-Drive	Talk with ANIS as they have a nice set up for storage of big amount of data.
Entomology and Plant Pathology (PATENT)	Need a large, safe, and secure backup data storage system. O-Drive not safe enough Data on personal drives without secured and safe backup storage are at the risk of getting lost.	Data needs to be protected when stored at rest, thus, we gladly welcome the departments common data management platforms (Wheat Rust and Potato late blight Toolboxes), which is based on the "FAIR" principles.
Soil Physics and Hydropedology (JORD)	Different versions of same files and no metadata available  Data flow and storage from Automated systems (drones, robots, lab equipment with automatic measurements)	The Data Management Committee should provide guidelines for metadata generation, how data should be stored and arranged
Crop Genetics and Biotechnology (CGB)	Need a platform to store sequencing data from bigger sequencing projects	Data management plan, Data stewards and an effective data management system.
Climate and Water (KLIMA)	Different versions of Access databases for same trials, difficult to extract and understand the raw data, Automated dataflow difficult.	Make a proof of concept converting the Crop Rotation Experiment data into a SQL database and including features and tools for effective data flow, data management, display and analysis of the data
Agricultural Systems and Sustainability (SYSTEM)	We do not store data on a common (open) drive. Data are located locally or in a messy project folder on O:\ or published in DCA/DCE reports, journals, etc.	Huge willingness to create a metadata-description of existing and future data, to clarify who to go to for more information and to increase interdisciplinary work.

## **Personal questions – notes on the small post-it's (5 minutes)**

- A) What are your needs for better management of your data
- B) What do you see as opportunities for improving the FAIR management of your data

## **Group discussion – notes on the large post-it's (10 minutes)**

- C) Discuss who should do what related to the needs and opportunities identified by the colleagues at your table

