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Uncovering the Relationship Between Dietary Fatty Acids and Fiber Digestion in the Rumen

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Data Management Plan

a. Expected Data Type

All data collected and used in this project will be primary data. Both digital and non-digital data will be collected. Digital data will be collected in the laboratory using specific pieces of equipment such as gas-chromatographer, gas chromatograph-mass spectrometer, continuous-flow combustion-mass spectrometer, plate reader (ELISA technique), automated electrophoresis analyzer, UV-Vis spectrophotometer, and RNA sequencer. Raw digital data will be collected and specific parameters will be extracted from it and summarized in a Microsoft Excel spreadsheet. Non-digital data such as continuous culture fermenters' daily flow rates as well as pH and conductivity will be also collected. Non-digital data will be manually entered in notebooks and transferred into a Microsoft Excel spreadsheet once a week. All the spreadsheets will be stored in Box.com.

b. Data Format

Some of the data collected will have a specific format from the software in the instrument. This raw data will be exported into an Excel spreadsheet and saved in the experiment's Box folder. Manual data will be also recorded in a laboratory notebook. Data collected in notebooks will be exported to spreadsheets and stored in Box. A copy of the laboratory notebook (JPG) also will be included in the Box folder. RNA sequences will be received as digital files in the FASTQ format via secure file transfer protocols (SFTP) and will be stored in Box. Data collected will be analyzed using Statistical Analysis Software (SAS, v. 9.4) and the SAS code (docx) and output (docx) will be stored in Box.

c. Data Storage and Preservation

Each experiment will have a specific folder on Box, named after the initials of the person performing the experiment, the year that the experiment was performed, and a keyword indicating the experimental model. For example, FB19 Fermenters indicate that Fernanda Batistel performed an experiment in 2019 using continuous culture fermenters. Inside the main Box folder, four other folders will be created as follow: a) Overall project stuff: experiment design, treatments, diet composition, sampling schedule, and labels to be printed for sample collection will be kept in a Microsoft Excel spreadsheet; b) Raw data: ALL the Microsoft Excel spreadsheets containing the raw data and a copy of the laboratory notebook (JPG) will be stored in this folder; c) Stats: all the data set organized to perform the statistical analyses, the SAS (Statistical Analysis Software) code, and the SAS output (docx format) will be kept in this folder; and d) Manuscript: this folder will contain a Microsoft Word file containing the draft of the manuscript as well as a pdf copy of the references cited into the manuscript. The experiment Box-folder will be shared with the PI, the student responsible for the experiment and the laboratory manager. Additional to Box, data will be stored in two computers in the PI's laboratory. Laboratory notebooks will be kept in the laboratory over the duration of the project and moved to the PI's office after the project is terminated. All the samples collected in this project will
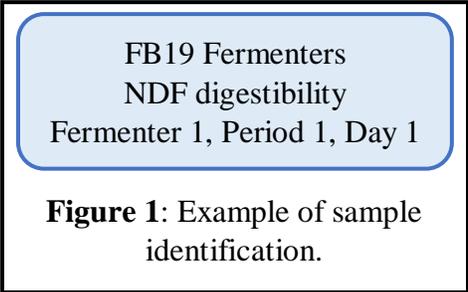
FB19 Fermenters
NDF digestibility
Fermenter 1, Period 1, Day 1

Figure 1: Example of sample identification.

be labeled with the experiment name, the analysis that will be performed, culture bottle or fermenter ID, and day or time-point using laser-printed labels (**Figure 1**).

d. Data Sharing and Public Access

Research data will be kept confidential and will be shared with the public through publications in peer-reviewed journals and through presentations and professional meetings. After publication, raw and processed data will be available to the public through placing it in DigitalCommons@USU, Utah State University's institutional repository. DigitalCommons@USU supports all the file types and formats. Files are provided with persistent URLs, and if needed, a DOI. All files are backed up at multiple sites, including cloud storage.

e. Roles and Responsibilities

A data management plan (DMP) will be implemented by the PI of this project, her laboratory manager and students. Graduate students will be responsible for collecting data in their notebooks and transfer all the data (digital and non-digital) to Box.com in the right format. The PI will oversee that the overall DMP is correctly and timely implemented. Once the students graduate and after the project is finalized the PD will be responsible for long-term storage and preservation.

f. Monitoring and Reporting

We acknowledge that the project and the DMP will be monitored as specified by NIFA. The implementation of the DMP will be reported to NIFA through REEport and will include data sharing activities such as publications, presentations to conferences, and progress on storage activities. Dr. Batistel will ultimately be responsible for reviewing and revising the DMP when necessary.