

Final project – Straw data

Goal:

Investigate the following, and explain what and why you see what you do:

- Is there a difference between the locations?
- Is there a year effect?
- Can you predict xylose and glucose release?
- Is the xylose and glucose release correlated? If yes, is this a problem?
- Can a model on one year/ set of locations explain the remaining samples?

Filename: straw.ltx

Number of samples: 1124

X (1124x1050): 1124 samples measured by NIR in the range 400-2498nm (400-1098 nm is the VIS range, and 1100-2498 nm is the NIR range)

Pure (3x1050): Spectra of pure samples (ligning, cellulose and xylose)

Yref (1124x2): Glucose and xylose release (measured by an enzymatic degradation)

ID (1124x2) Location – 9 different (see below)

Year – 2006, 2007 and 2008

Location:

- | | |
|-----------------|--------------|
| (1) Abed | (6) Sejet |
| (2) Fyn | (7) Søtoften |
| (3) Holstebro | (8) Tystofte |
| (4) Hornsherred | (9) Taastrup |
| (5) Rothamsted | |

Description:

In the energy sector, it is of interest to know the energy potential of the raw material that is bought by the producer. Currently, the state-of-the-art method for determining the sugar potential of straw is by the use of an enzymatic kit, requiring several analytical steps in order to achieve a reference value. It is

therefore of interest to investigate whether it is possible to get a faster estimate of the potential through the use of NIR.

This is a dataset collected across several years, and through several locations. It is actually a gathering of experiments done for different purposes, but here all the samples have been measured for the same two constituents of interest: glucose and xylose release.

These data have kindly been made available by Jane Lindedam.

Table 1: Complete overview of all the samples.

Year	Location	Comment	#
2006	Abed Sejet	106 modern northern European varieties	208
2006	Abed Holstebro Sejet Tystofte	20 modern northern European varieties	79
2007	Abed Holstebro Sejet Tystofte	20 modern northern European varieties	317
2007	Taastrup	102 old varieties released to the market in the period from 1902 to 1990	167
2008	Taastrup	102 old varieties released to the market in the period from 1902 to 1990	201
2008	Rothamsted	One variety with 19 different fertilizer applications of organic and inorganic fertilizers	57
2008	Holsbebro Søtoften	10 modern northern European varieties	80
2008	Fyn Holstebro	5 varieties	10
2008	Hornsherred	2 varieties at 3 harvest times	5