NIRS prediction comparison between UMN and Europe

Conclusion

The common predicted values between UMN and Europe were crude protein (CP), acid detergent fiber (ADF) and neutral detergent fiber (NDF).

These forage quality parameters were adjusted to a percent of dry matter basis

We only have a comparison of one cutting, which was taken on 14Sep2022 of sorghum sudangrass.

At this stage, the sorghum sudangrass was near heading. Some seedheads were fully emerged.

At this stage, we predict CP~9, ADF~40, NDF~65.

UMN underestimated CP, ADF and NDF relative to Europe and what we expected to observe.

Table 1. Estimated Nutrient Composition (DM-dry matter, CP-crude protein, ADF-acid detergent fiber, NDF-neutral detergent fiber, TDN-total digestible nutrients, Ca-calcium, P-phosphorus.[2]

Forage	DM	CP	ADF	NDF	TDN	Ca	P
	%, as is	---------- %, DM basis ----------					
Forage sorghum							
silage, dough stage	28	6.0	--	--	55	0.29	0.26
Sorghum-sudangrass							
fresh, early vegetative	18	16.8	29	55	70	0.43	0.41
fresh, mid-bloom	23	8.8	40	65	63	0.43	0.36
hay, full bloom	91	8.0	42	68	57	0.55	0.30
silage	28	10.8	42	68	56	0.46	0.21
Corn							
silage, well eared	33	8.1	28	51	70	0.23	0.22

Figure 1: https://www.extension.iastate.edu/sites/www.extension.iastate.edu/files/iowa/SudanFS50.pdf

Table 1: Predicted forage quality with NIRS of sorghum sudangrass when cut at heading stage

method	CP	ADF	NDF
Europe	10	34	64
UMN	8	32	61

Histograms

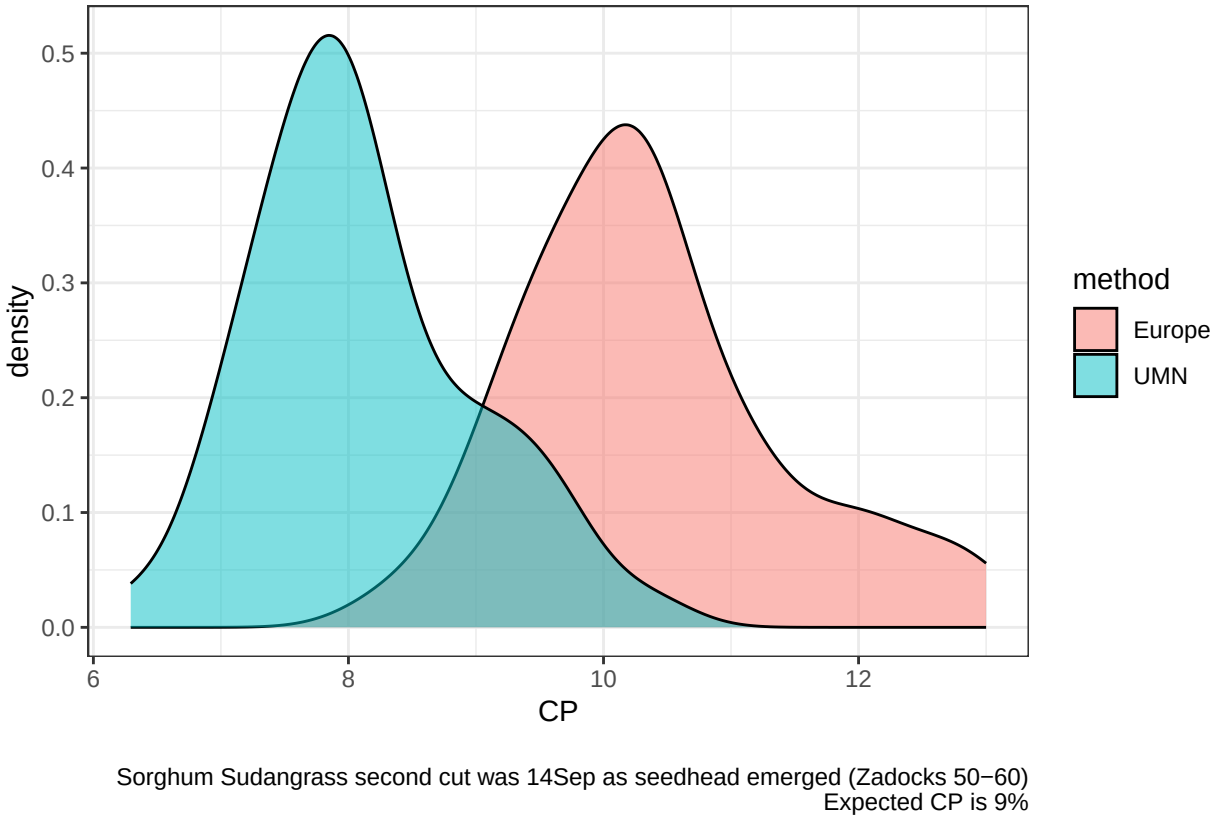

Figure 2: Crude Protein

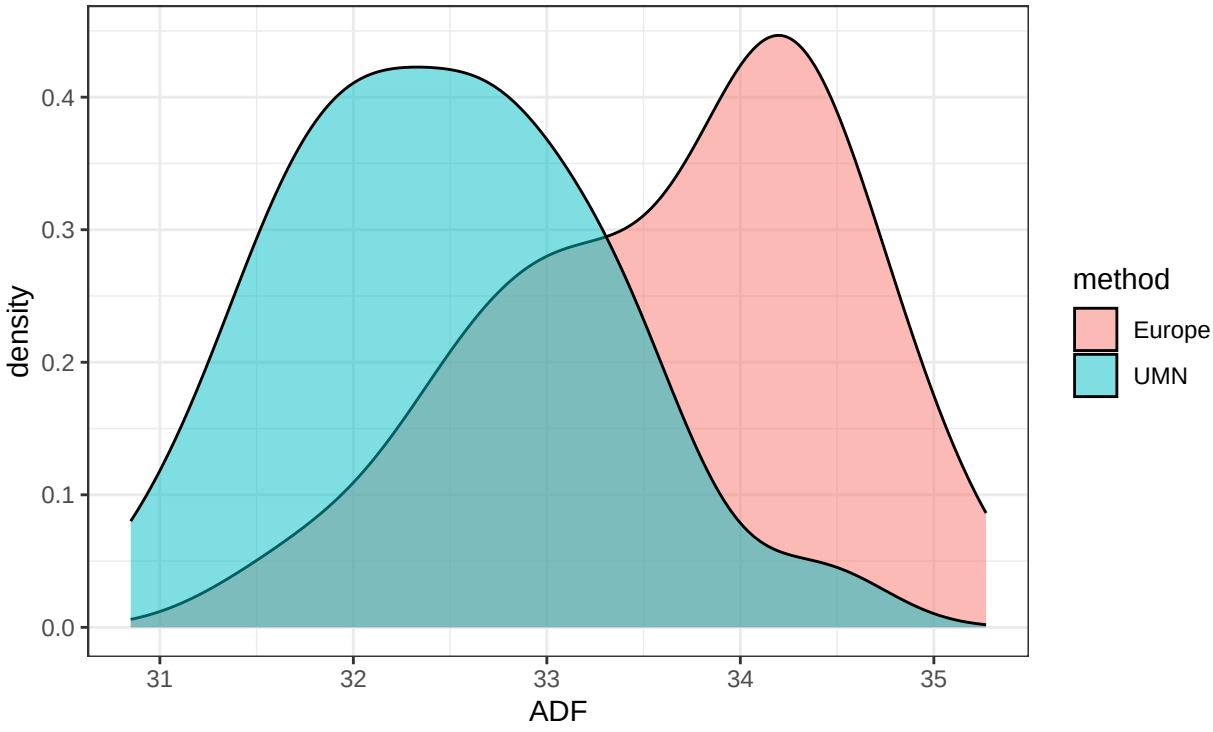
density
0.4
0.3
0.2
0.1
0.0
31
32
33
34
35
ADF
method
Europe
UMN
Sorghum Sudangrass second cut was 14Sep as seedhead emerged (Zadocks 50−60)
Expected ADF is ~40%

Figure 3: ADF

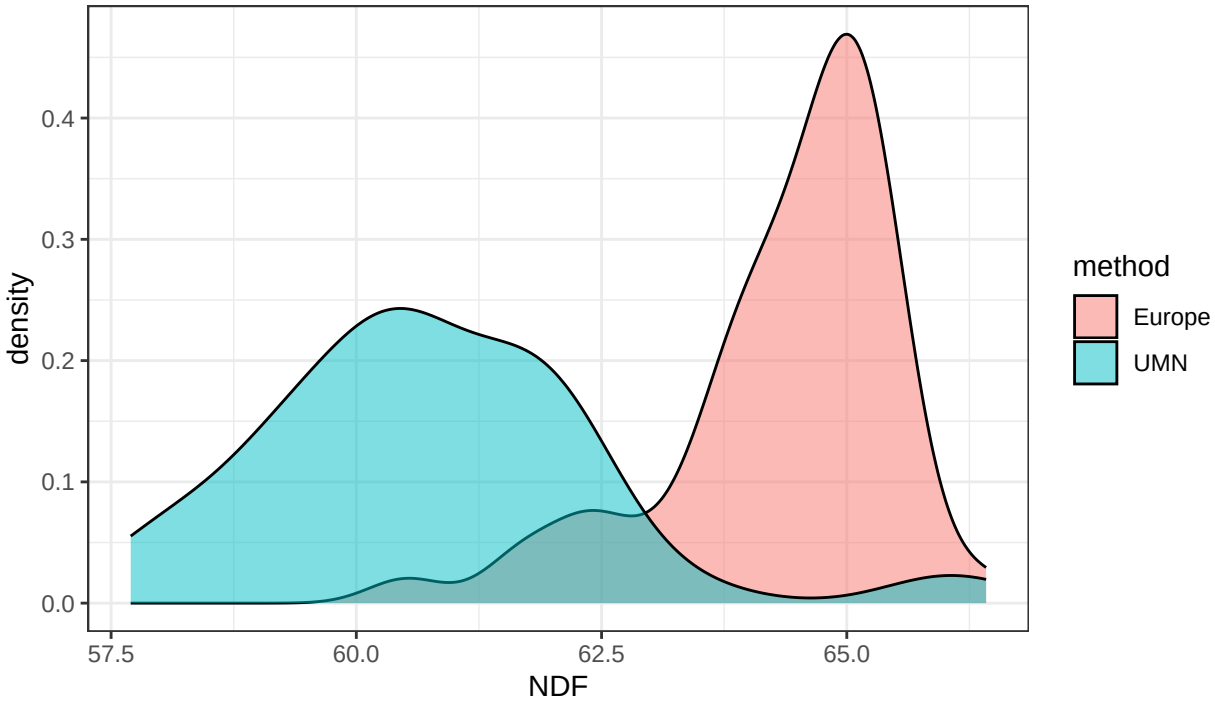
density
0.4
0.3
0.2
0.1
0.0
57.5
60.0
62.5
65.0
NDF
method
Europe
UMN
Sorghum Sudangrass second cut was 14Sep as seedhead emerged (Zadocks 50−60)
Expected NDF is ~65%,
UMN appears to be underestiming NDF

Figure 4: NDF

Figure 5: Sorghum Sudangrass at cutting. Zadocks between 50 and 60