**BACKGROUND**

Different kinds of sunflower meals (SFM) exist according to the level of seed dehulling before the crushing process: non dehulled (HiPro, LP), partially or highly dehulled (HiPro, HP). This leads to differences in crude protein (CP) and cell wall (NDF) contents, with a high range of variability [mean ± SD (min-max)]:

- **LoPro CP:** 30.7 ± 1.8 (24.36- % DM, NDF=47.0± 4.3 (26-59) % DM
- **HiPro CP:** 40.5 ± 1.5 (36-55) % DM, NDF=34.9± 5.5 (22-49) % DM

(INRA-CIRAD-AFZ Tables, 2018; www.feedtables.com)

Currently, about 900,000 tons of HiPro sunflower meal are imported in France, especially from the Black Sea area (Terres Unives, 2017).

**OBJECTIVE**

The aims of this study were:

(i) to measure the rumen nitrogen degradability of imported HiPro SFM,
(ii) to verify the relationship between nitrogen in vitro enzymatic and in sacco degradability for these feeds,
(iii) to estimate their protein values for ruminants in the new INRA system (2018).

**MATERIAL AND METHODS**

- 65 samples of SFM, collected to study the variability of their chemical composition (15 French & 50 imported from 8 countries) (CP=390±42 g/kg DM; NDF=324±70 g/kg DM; N in vitro enzymatic degradability, NED1=54.7±4.8 %)
- 15 samples chosen among them, representative of the observed range of CP, NED1, origins and types (Table 1).

**RESULTS AND DISCUSSION**

- EDN varied from 80 to 87 % with a mean value (83.4±1.9) higher than INRA 2018 tables (+7points)
- Very closed EDN mean values for the different types of SFM and various origins
- Relationships between ED6N and NED1 on 15 SFM samples (figure 1)

  \[ ED6N = 0.29 + 0.29 \text{NED1} (\%); (n=15; R^2=0.84; ETR=1.9) \]

No statistically different slope from SFM samples in Aufrère model

\[ \text{SFM (Aufrère et al., 1989)}: DT6_N = 67.1 + 0.36 \text{DE1} (\%)\]

\[ \text{(Ntot=112; Ngroups=13; R^2=0.97; ETR=2.9)} \]

Compared to INRA 2018, quite different “Table” protein values of the 12 studied HiPro SFM, but similar “Tables” net energy values:

\[ \text{PDI} = 109 ± 6 \text{g/kg DM} \]
\[ \text{RPB} = 235 ± 18 \text{g/kg DM} \]
\[ \text{UFL} = 0.88 ± 0.02 \text{kJ/kg DM} \]
\[ \text{UVF} = 0.81 ± 0.03 \text{kJ/kg DM} \]

(INRA 2018: CP=405 g/kg DM & NDF=349 g/kg DM; N in vitro enzymatic degradability, NED1=54.7±4.8 %)

**CONCLUSION**

- Large and recent data set of sunflower meals from various origins
- Similar N degradation kinetics for French & imported HiPro SF meals
- Higher observed EDN values compared to INRA 2018 Tables
- Same slope between ED6N and NED1 than that of Aufrère et al., 1989
- But higher intercept for the 15 studied SFM samples
- Protein values different from INRA 2018 Tables

**Table 1: Chemical composition of the 15 tested SFM**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM (g/kg)</td>
<td>89.8</td>
<td>1.4</td>
<td>87.5</td>
<td>92.5</td>
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<td>Ash (g/kg)</td>
<td>77</td>
<td>6</td>
<td>63</td>
<td>89</td>
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<tr>
<td>CP (g/kg)</td>
<td>390</td>
<td>47</td>
<td>298</td>
<td>506</td>
</tr>
<tr>
<td>Fat (g/kg)</td>
<td>19</td>
<td>7</td>
<td>13</td>
<td>41</td>
</tr>
<tr>
<td>CF (g/kg)</td>
<td>207</td>
<td>49</td>
<td>96</td>
<td>314</td>
</tr>
<tr>
<td>NDF (g/kg)</td>
<td>319</td>
<td>83</td>
<td>95</td>
<td>461</td>
</tr>
<tr>
<td>ADF (g/kg)</td>
<td>210</td>
<td>84</td>
<td>14</td>
<td>344</td>
</tr>
<tr>
<td>ADL (g/kg)</td>
<td>64</td>
<td>21</td>
<td>15</td>
<td>104</td>
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<tr>
<td>NSO_l_KOH (%)</td>
<td>76.9</td>
<td>3.6</td>
<td>71.3</td>
<td>82.8</td>
</tr>
<tr>
<td>NED1 (%)</td>
<td>53.1</td>
<td>6.3</td>
<td>40.5</td>
<td>63.7</td>
</tr>
</tbody>
</table>

**References**


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