WP1 - Grazing protocol

Spring 2023

- Objective: Obtain data on the grazing preferences of sheep allowed to graze on the grazing section of the experimental site.

- Data to be collected (excel file template):
    - Starting point of grazing day: top, middle, bottom of experiment.
    - Sheep head position (up/down) every 5 min.
    - Sheep position by plot number.
    - Sheep behavior every 5 min (grazing, not grazing, ruminating, moving).
    - Start and end time.
    - Sheep number per plot
- Animals involved: Ewes of the **same breed** and **similar weight** should be non-pregnant and in the **dry period** (not being milked), so they only need low energy maintenance requirements, to have a homogeneous flock. Better use sheep **used to grazing**.
- Number of sheep: **6** animals will be introduced in the grazing area. This stocking rate is quite high for a commercial herd, but 6 sheep will be more representative of the animal behavior.

- Site preparation: A fence should be installed at the site delimiting the grazed area. Sampling for yield, forage quality, and species separation must be done before the beginning of the grazing protocol on a 0.5 x 0.5 m plot in the middle of the grazed part of each subplot. Locations with more than 1 cut per year consider sampling only one of the periods.
  Optional: send the samples to Slovenia to determine feed quality before and after grazing.

- Surface available: 600 m^2, 40 plots x (5 m x 3 m, grazed area of the plot).

- Start of grazing criteria: The start of the grazing experiment will be determined by the mean height of the sward, starting when the sward is overall 15 cm high. The phenological stage and/or sward height of each plot should be registered to include it in the statistical analysis of preference.
  Optional: Sward height at each plot.

- Daily animal management: When sheep are introduced to the field, they should be guided to the specific daily sections in the grazing area (e.g., top, middle, bottom of the grazed area), So we decrease the probability of the animals grazing at the entrance or any other sections of the field. We start over the procedure until the end of the grazing period.

- Duration of daily grazing: Daylight grazing is proposed, putting the ewes in the grazing area in the morning, and taking them out at night. No additional feeding is required. They should go back to the barn except if strictly necessary. If kept outside, cut the herbage off at the resting area before starting the grazing experiment.

- After grazing: At night, ewes should have access to water and straw only. Additional feeding only if strictly necessary. No feeding after midnight (12 a.m.)

- Water availability: During nighttime, ewes should have access to water, especially before and after grazing. Preferably, no waterers should be present on the field to avoid grouping near a plot. If animal welfare regulations require water availability in the grazing field, then 4 waterers should be placed on each side of the grazing field.

- Periods of grazing: The expected grazing period is close to 1 week, 3 to 5 estimated days, depending on the location and the climate conditions. The time from start to end of grazing could vary according to the start and end of grazing criteria. Different periods and repetitions over the growing season could be recorded. France and Slovenia: 2-3 grazing episodes per year expected; other locations: 1-2 episodes expected.

- End of grazing criteria: Grazing will be stopped when:

    - Animal welfare is compromised, before the sheep are stressed.
    - Before overgrazing of sward occurs.

  It could go for 2-3 days in France, perhaps 5 or more in other locations.

- Animal welfare: A coulpe of recommendations:
    - If temperatures get too high (threshold depending on breed and location), remove them to resting area.
    - You can place a water point beside the field, away from the plots, and bring them there if necessary

- Preference recording: A camera will take photos of the field every 5 minutes. The photos taken will be analyzed using scan sampling, determining the position and behavior of the animals every 5 minutes. The camera should be positioned on a pole or a tree nearby, taking into consideration that the whole field should be visible, as well as the position of the ewes and their head positioning.
  Optional:
    - A behavior analysis of intake (using visual observation) could complement the preference analysis.
    - Each plot number should be marked with A4 colored (numbered from 1 to 40) mark on a stick for easier determination of plots from the distance (observation point). Fear of new visual objects. Sheep have no depth perception.

- Sward usage control: sample a 50 x 50 cm quadrat in each plot **before** the animals enter and repeat again **after** they leave. Separate **per species**.

Figure 1 Grazing protocol scheme