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**Title: Grazing decisions through animal’s eyes: animal-borne video cameras on free-ranging animals**

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**Abstract:**

Feed intake is probably one of the most important constraints on ruminant productivity irrespective of the type of production system. Eating is a voluntary act that includes decisions such as when, where, what and how much to consume. These decisions, ultimately define the overall dietary quality, the total amount consumed and the highly adaptable behaviour pattern. The complexity of the mechanisms responsible for the regulation of food intake are even greater when animals are free-ranging, an environment where accurate estimates of dietary choices and of structure of intake (meal bouts and criteria) pose methodological difficulties. Improving these methodologies will help to understand foraging behaviour in natural grazing conditions.

Our purpose was to assess grazing behaviour from the perspective of the animal (point-of-view -POV) using commercial of-the-shelf (COTS) video cameras carried by grazing animals and allowing continuous video recording of behavioural sequences.

Six ewes carrying GoPro® cameras, grazing a natural pasture were used, in four sessions spread out in time, providing differences in the phenological state and nutritive value of plants. Easy to use open-source software (OSS) for audio and video editing and for digital image analyses, allowed the classification of feeding station selection by grazing animals (height, greenness index an type of plants) and of the corresponding foraging events (walking, resting, grazing) and meal criteria (feeding bouts, bites and chews).

Case studies taken from the field experiment will be used to illustrate the scope and application of this approach. A rich record of behaviours along a trajectory is generated, yielding data on foraging behaviour patterns, together with diet selection and highlights the usefulness of the approach to find underlying principles of grazing decisions, such as grazing station attributes, plants preferred and time allocated to search and handle feed. The set of multimedia data (acoustic, video, and image) of what the animal sees in the field, sounds resulting from oral manipulation of food, the fine-scale animal movements related with pasture features and the diet-linked meal criteria provide an essential context for understanding animal decisions. Along with the lengthy time required for data interpretation, the limited battery span represents a major drawback, currently restricting the use of POV cameras to hypothesis-driven studies. Nevertheless this approach provides a powerful and integrative tool by providing a unique context for understanding animal decisions and interactions with other individuals and with feed resources supporting better understand how animals select their food resources and habitats.