Collaborative Construction of a Method that Contributes to Improve the Decision Making in Associative Ranches by Controlling the Grass Allowance in a Context of Climate Variability

Emilio Duarte Esteves
Instituto Plan Agropecuario, Uruguay

Rómulo Cesar
Instituto Plan Agropecuario, Uruguay

Javier Fernández
Instituto Plan Agropecuario, Uruguay

Marcelo Ghelfi
Instituto Plan Agropecuario, Uruguay

Valentina Herrera
Instituto Plan Agropecuario, Uruguay

See next page for additional authors

Presenter Information

Emilio Duarte Esteves, Rómulo Cesar, Javier Fernández, Marcelo Ghelfi, Valentina Herrera, Virginia Caravia, Rodrigo Iribarne, Federico de Brum, Héctor Rodríguez, and Marcelo Pereira Machín

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Emilio Duarte Esteves [1], Rómulo Cesar [1], Javier Fernández [1], Marcelo Ghelfi [1], Valentina Herrera [1], Virginia Caravia [2], Rodrigo Iribarne [2-4], Federico de Brum [3], Héctor Rodríguez [5], Marcelo Pereira Machín [1]

[1] Instituto Plan Agropecuario E mail: eduarte@planagropecuario.org.uy [2] Hired technicians [3] Instituto Nacional de Investigación Agropecuaria [4] Facultad de Agronomía [5] Instituto Nacional de Colonización

Summary

Pasture management and the particular conditions of each year are responsible for productive results, farm income, and condition of the pasture. A simple and robust method that relates the available grass and the required grass was built in a participatory manner, and contributes to a critical reflection process among the group of decision-making, adapting to their context. In 17 farms from the Basalt region in Uruguay, grass and animals were monitored seasonally. A simple method was developed with farmers, and from de offer needed to meet production targets (KgMS/KgPV) the amount of grass requires was calculated. The grass height was measured with a ruler in order to obtain the available grass. From the relationship between the available grass and the necessary grass, a situation index (ISPC- Index on the food plate) was developed, and ranges were established with colors. Index less than 0.6 with Red color, between 0.6 and 0.8 Yellow, between 0.8 and 1.2 Green, and greater than 1,2 brown. Each group of ranchers analyzed their seasonal index together in workshops with other ranchers and guest technicians, who proposed alternatives to place the index whitin the optimum range. The host ranchers group selected and ordered the proposed alternatives by priority, and the resulting actions were described by using UML (Unified Modeling Lenguage) diagrams. Each rancher obtained one UML per season, with the right action to be taken in case of deficit or excess of grass. This process incorporated local, professional and academic knowledge, and by applying a simple method, measures were adapted according to the context of each rancher. The technician role was to facilitate the process by creating an environment that stimulated critical reflection, supported by real evidence. Participating ranchers achieved the ability to measure, relate, discuss an decide, and significantly improved their productive results by adopting participatory constructed methodology.

Introduction

Uruguay is a livestock country. It has the highest number of beef cattle (3.4 animals) and the highest consumption of meat (120 kilos) per inhabitant in the world. Breeding systems are mostly using the natural field as food, and are located in areas that are vulnerable to a water deficiency (Cruz et al. 2014). Drought episodes are common and their incidence in primary and secondary production is significant affecting physical and economic outcomes, and the trajectory of farmers and their families (Bartaburu et al. 2015). The most commonly used indicator in Uruguay to define the number of animals that can eat on a field is the endowment. Livestock Unit (UG) is what we use to refer for endowment. This allows to obtain a value in total livestock units at a certain time, beyond the animal species and categories. By dividing the total UG by the total area, you get the endowment, in UG/ha. The limitation of this method is that it references animals (UG) with surface area, but without describing the ability of actual grass. Do Carmo et al. (2019) concludes in his work that the control of the fodder offer improved the results, but identified limitations in adoption, and highlighted the need to involve farmers in discussions on proposed changes as well as monitoring. The lack of decisions in a timely way about the grass supply, causes the particular conditions of each year explain much of the productive results, property income, and condition of pasture, Soca et al. (2009). This statement is proven, and food mismatch situations can be observed due to the effects of climate variability affecting grass growth, such as lack of decisions in a timely way to adapt to these variable situations.

Participatory construction of a method that includes; monitoring grass and animals, diagnosing the forage situation, arguing on the basis of evidence, and facilitating decision-making to adapt to situations as variable as it is uncertain, will help lift important constraints on livestock systems, especially in associative systems, where decision-making is more complex.

Materials and Methods.

The monitored farms were selected in the Basalt Region, where the RLN del IPA has influence on. IPA, an extension institution, implemented the project, in collaboration with research institutions (INIA and FAGRO), development (MGAP and INC) and 9 farmers organizations. Reference grounds were initially developed; 10 individual management and 7 associative management.

The 17 ranches are mostly breeders, all have cattle, some sheep and have different surface.

Workshops were held to level knowledge and the monitoring protocol was developed. Monitoring began in spring 2017 and culminated in winter 2019. In summer 2017/2018 rainfall was below average, while in summer 2018/2019 above average.

Monitoring was carried out for 2 years in all 4 stations. The grass height was measured with a ruler for availability. The animal's weight was obtained with balance, and the demand for grass was defined according to the animal category (rearing, grazing and wintering) and production objectives. Based on the relationship between total available grass (Kg.MS) and total required grass (Kg.MS), an index was developed, which ranchers named the Food Plate Index (IsPC). For IsPC values, color ranges were set to interpret the diagnosis. Index less than 0.6 (on that field there are less than 60% of the necessary grass), Red indicating "danger", between 0.6 and 0.8 Yelow "caution", between 0.8 and 1.2 green "optimal", and greater than 1.2 Brown "excess of grass".

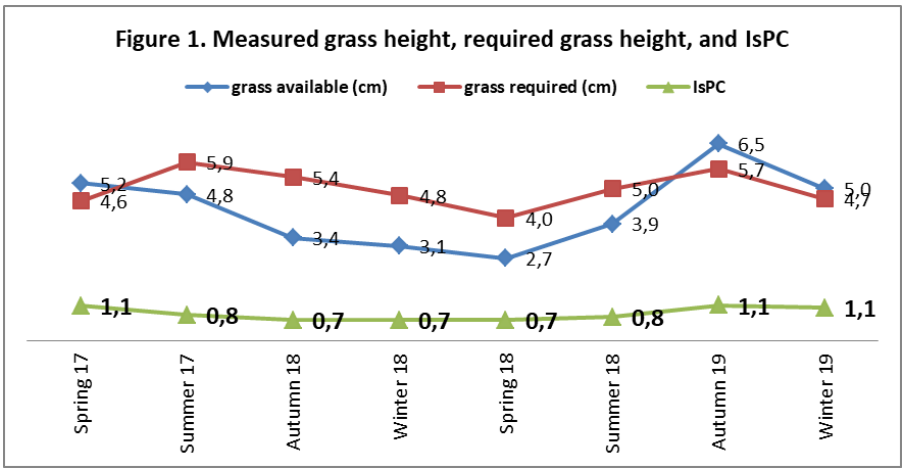
The seasonal IsPC obtained on reference grounds was analyzed together with other ranchers and guest technicians, in seasonal workshops, where alternatives were identified to place the IsPC within the optimal range. Subsequently, the host rancher selected, supplemented and ordered the proposals by priority. Strategies to control the offer of fodder (animal sales, supplementation, etc.) were described using UML diagrams, easily interpreted. Finally, different strategies were applied for the escalation of the built method; (a) field days where the monitored producers tell other ranchers the method used and results obtained, b) predial accompaniment to new stakeholder groups, c) training courses to producers and d) dissemination in articles, seminars, congresses, etc.

For the evaluation device, questionnaires were designed for ranchers who assisted to workshops, conferences, accompaniments and courses, and forms for external technicians and team members.

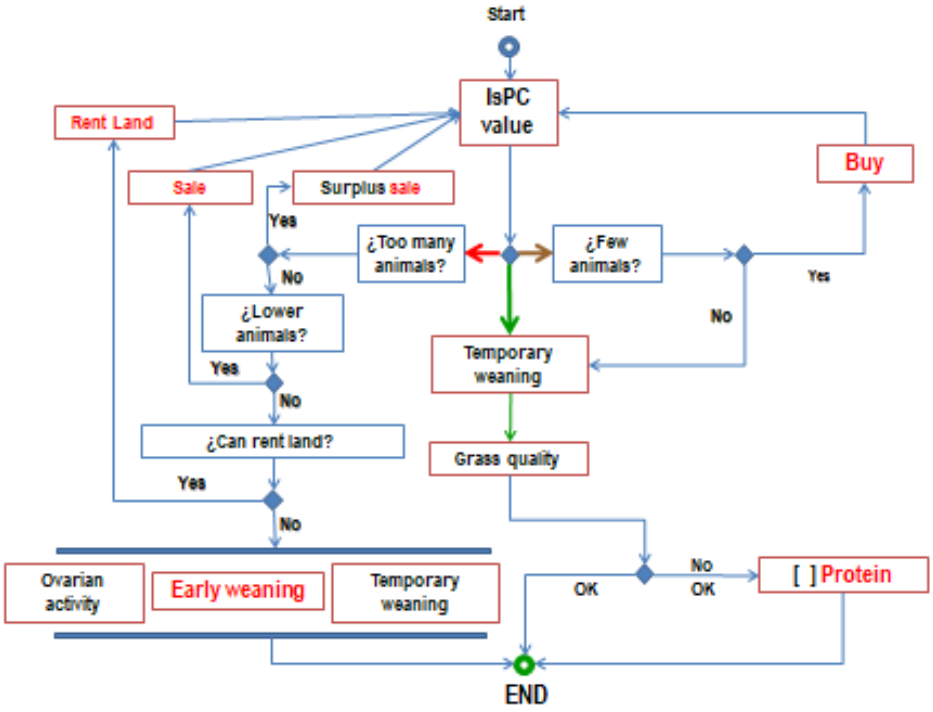
Results

It was possible to develop necessary fluidly reference fields. In a participatory way, a simple method was developed to measure grass and animals, and producers acquired the ability to measure.

Seasonal monitoring was carried out and the IsPC that related the grass available in grassland with the grass required by animals was built, and was used to diagnose the forage situation. Figure 1 shows average values for the group of ranchers, measured grass height, required grass height, and IsPC.



From workshops, a decision diagram (UML) was built for each site containing the actions to keep the IsPC within optimal range. Figure 2, Action diagram to keep the IsPC in optimal range. Example Itapebí Group, Summer.



Regarding the workshops, expectations were met for all participants, there were no negative responses. Methodological aspects were highly valued as an educational extension tool, most participants evaluate between good and excellent the possibilities; contribute, learn, know the experiences of others, raise doubts with technicians and/or producers, motivate yourself to apply what you have learned, join with others to do things in common, and engage with others for friendship purposes. More than 90% of attendees noted that they learned new things or have new ideas (reflections on things they already knew) and stated that they want to apply it. All participants say they talked to other neighbors about it in the workshops (between 3 and 10).

In training courses and farm conference (escalation) surveys were conducted by consultation on; the practicality of the method to quantify the grass of the property and the demand for grass of animals, and the usefulness of

the IsPC to make decisions on the premises, and for all questions 100% is between Excellent, Very good and good, there are no negative assessments (Bad, Very Bad).

Discussion

A simple and robust method was built in a participatory manner that related two important variables; the available grass, the required grass, and from its relationship (IsPC) critical reflection was facilitated among farmers (Discussion Workshops) to suit each context (UML).

The reference grounds were strongly involved in the development, applied the methodology and improved its results.

Ranchers who were invited to participate in workshops, farm conference and training courses expressed a desire to apply what they have learned on their premises, indicating a favorable a priori evaluation (by the technique learned of grass measurement and/or by the decisions viewed from the application of the technique). We can conclude that to make decisions it is necessary to monitor or measure. The variable grass height is very robust for the information it provides, and is very simple to obtain, an important feature when it comes to implementing it.

Finding robust and simple variables was a very difficult sophistication, but it was achieved from participatory work between ranchers and technicians. The objective information provided by the monitoring, and its relationship, allowed to reflect with evidence, otherwise the discussion leads to assumptions which takes to decision-making unfit to reality. It could be seen that availability of grass on the premises was a result variable, mainly as a result of the climate and animal load applied by each producer, and allowed to justify the results obtained. On one hand, from the evolution of the IsPC, the results achieved could be better understood and explained, and on the other hand the same ISPC acquires a forward-looking value and that justified proactive actions (behavior that anticipated changes) in the face of future scenarios. From a simple indicator, IsPC, but with a lot of technical content, it was possible to diagnose whether the grass is sufficient, leftover or missing, according to animal requirements, which allowed reflection among the participants. The resulting methodology is being applied in different escalation strategies, training, group accompaniment (in agreement with INC) with excellent evaluation by producers, and its use as a tool in new extension projects was planned.

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