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Some considerations about the contribution of small ruminants to bovine farming systems sustainability

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Abstract. Based on a set of indicators, identified by using the MESMIS methodology (Framework for Evaluation of Natural-Resource Systems Handling through Sustainability Indicators), we perform a relative evaluation on economic, social and environmental sustainability aspects, between farms with bovines of Maronesa breed and sheep and/or goats for meat, and farms only with bovine Maronesa breed in their production area (mountain chains Marão-Alvão-Padrela). The results show that simultaneous production of the three species presents better economic, social and environmental results. The differences are more accentuated on economic indicators and less evident when the financial supports provided to the current activity are considered.

Keywords. Sustainability – Indicators – Bovine – Sheep and goat.

Quelques considérations sur la contribution des petits ruminants à la durabilité des systèmes de production de bovins

Résumé. En utilisant des indicateurs définis par la méthode MESMIS ("Marco para la Evaluación de Sistemas de Manejo de Recursos Naturales Mediante Indicadores de Sustentabilidad"), nous réalisons une évaluation relative de la durabilité économique, sociale et environnementale, entre l'élevage conjoint de bovins de race Maronesa et d'ovins et/ou de caprins pour la viande, et l'élevage bovin exclusivement, dans leur territoire de production (zone montagneuse de Marão-Alvão-Padrela). Les résultats obtenus montrent que la production simultanée des trois espèces d'élevage est plus favorable en ce qui concerne les résultats économiques, sociaux et environnementaux. Les différences sont plus remarquables pour les indicateurs économiques, mais plus faibles quand les aides financières attribuées à l'activité courante sont considérées.

Mots-clés. Durabilité – Indicateurs – Bovins – Ovins et caprins.

I – Introduction

The term "sustainability", used here and that is becoming more common in our vocabulary, seems to be the keyword for the future of the farming sector, towards the development of quality in balance with environment, with social promotion and, simultaneously, generator of income to agents that depend on it.

In an ongoing research of sustainability evaluation of the production of bovine Maronesa meat, in the geographic area matching the locus of the place of origin of the local cattle breed Maronesa (mountain chains Marão-Alvão-Padrela), we are using the MESMIS methodology - "Marco para la Evaluación de Sistemas de Manejo de Recursos Naturales Mediante Indicadores de Sustentabilidad" (Framework for Evaluation of Natural-Resource Systems Handling through Sustainability Indicators, Masera *et al.*, 2000). This procedure is based on FAO's Framework for the Evaluation of Sustainable Land Management (FAO, 1993), whose proposal for assessment of sustainability is based on a strategy of full analysis of production systems, including economic, social, and environmental aspects. MESMIS uses a comparative or relative approach in order to evaluate the differences in sustainability between a reference

system and an alternative system or in the same system at different times. It is a cyclical process in which the conclusions serve to identify the critical points of sustainability and to modify the management systems, leading to initiate another evaluation cycle, based on a series of translating indicators of sustainability.

In this context we identified, in the research sample, cases of simultaneous breeding of different species, with special prominence (due to the number of cattle heads) of small ruminants. These were isolated and analysed, through the construction of a table of indicators and ratings, encompassing economic, social and environmental issues.

This work aims to evaluate the contribution of sheep and/or goats for meat production to the sustainability of farming systems based on the local cattle breed Maronesa in mountainous areas.

II – Methodology

The sustainability was evaluated by comparison of the production system of Maronesa cattle simultaneously with small ruminants for meat (suckling goats and ewes), and the production system with only the Maronesa cattle, in the mountain chains Marão-Alvão-Padrela. This comparison was performed through economic, social and environmental indicators.

Considering that the degree of sustainability of natural-resources systems will depend on the level of satisfaction on economic, social and environmental fields, the detailed analysis of the systems, following the aforementioned dimensions, allowed us to identify a set of critical points that were the basis for the 40 indicators found.

The economic indicators (13) evaluate; (i) the yield and profitability of the production factors (labour and capital); (ii) their economic reliability; the competition capacity; (iii) the diversification of activities; (iv) the financial support provided to the current activity; (v) the degree of autonomy of farms through dependence on external production factors, including capital; and (vi) the self-financing capacity and the existence of accounting records.

The (un)motivation factors of activity that influenced its sustainability, such as: (i) age; (ii) literacy training and information levels of the farmers; (iii) agrarian structure and degree of concentration of land property; (iv) evolution and trend of the activity; (v) living quality, labour and residence satisfaction of farmers and their families; and (vi) job creation and manpower requirements, as well as the insertion of the farmers in sector organisations are the main social indicators (18) that may affect the maintenance of the current activities and their future.

The selected environmental indicators (9) measure the main factors of environmental protection and natural resources preservation, namely: (i) the headage level; (ii) the energy efficiency; (iii) the greenhouse effect; (iv) the nutrients balance; (v) agro-chemical products application level; and (vi) land physical degradation and farming good practices developed.

The research took place on a sample (49: 37, bovine-only system; 12, bovine, ovine and/or caprine system) of existing farms within the study area (mountainous), having five or more adult bovines, regarding the year 2004. The data used for the analysis were obtained by a survey to the farmers.

III – Results and discussion

The economic, social and environmental indicators selected were individually measured by farm, through calculations based on Avillez *et al.* (1988); Bochu (2002); EC (2006); Groupe Planete (2000); Institut de l'Élevage (1999); MADRP (2002; 2005); MF and MADRP (2002). Later, all the indicators were relativised, being the bovine-only system as reference system (index 100).

Table 1 presents the averages of the indicators by economic, environment and social areas. The analysis of the main obtained results reveals the following:

(i) Greater relative sustainability for the farms which possess more than one specie simultaneously, regarding farms with bovine of Maronesa breed only.

(ii) The differences are more accentuated on economic indicators, and less evident when the financial supports provided to the current activity are considered. This is due to the fact that subsidies by unit of head ratio (and others related to it) are of lesser value when the three species are adopted, because in this case, the average number of total normal heads is three times greater. Although the best value of the economic area to the joint production of bovines and small ruminants for meat, the degree of financial supports by normal head, the dependency level of external inputs, and the self-financing capacity, are less favourable to this system.

(iii) Regarding social aspects, the most prominent negative factor, to the three species system, is the level of concentration of property, inducing a bigger dependence on external production factors, and relegating other indicators to a more satisfactory relative position. The indicators related to the received publications and positive perspectives about the agrarian sector present bigger differences between the studied systems, with favourable punctuations to the production of more than one specie simultaneously. This can derive, among other factors, to the biggest number of organisations that these farmers are associated, allowing a more frequent technical support, to various levels.

(iv) Beyond this, and although environmentally more beneficial, the energy efficiency isn't favourable to the joint production of bovines and small ruminants for meat. This is due, essentially, by the reduced or null volume of vegetables for sale, in the three species system, because they are directed to feeding the animals adopted in the farm.

Table 1. Relationship of sustainability attributes for bovine, ovine and/or caprine system and bovine-only system, in relative units (bovine-only system = index 100) (proper data)

Evaluation area	Without financial support	With financial support
Economical	177	137
Social	135	135
Environmental	146	142
Sustainability	153	138

Two main factors contributed to these results, besides the production of more than one species simultaneously: (i) The sheep and/or goats for meat production are essentially fed with pastures proceeding from communitarian lands and, for this, the production costs are very low; (ii) The area included the communitarian lands, for farming systems, that combine small and big ruminants is very superior (four times greater) relatively to the bovine-only production.

IV – Conclusions

The observation and analysis of the obtained results allows us to emphasize the greater sustainability of the farms that combine production of Maronesa breed bovines, sheep and/or goats, over the three dimensions (economic, social and environmental), relatively to the bovine-only production.

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