

## DAIRY CATTLE SUSTAINABILITY USING THE EMERGY METHODOLOGY: RENEWABILITY

### SUSTENTABILIDADE DA PECUÁRIA LEITEIRA, UTILIZANDO A METODOLOGIA EMERGÉTICA: RENOVABILIDADE

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The adoption of different management practices is a way to remain in the dairy business. The reduction of the dairy cattle in São Paulo was 35.47% between 1996 and 2008 (LUPA). In São Paulo State the milk production was reduced by 29.7% IBGE (1995 and 2006). In milk production systems the adoption of the rotational grazing and the use of more inputs, causes a great impact on the environment. The objective of this paper is to assess these impacts in farms with the semi-intensive system of milk production. The emergy methodology was used to calculate the renewability of milk production system. The Renewability or degree of sustainability ( $\%R = (R/Y) \times 100$ ) is the percentage of renewable emergy (R) used by the system and Y is the sum of all the resources used by the system. In long periods of time, only production systems with a high percentage of renewable emergy will prevail to the stress of today's market, while those using a high percentage of non-renewable resources will certainly go into decline. The farm studied is located in the municipality of Guzolândia and yields 650 liters of milk per day with 45 lactating cows, 30 ha of pasture with supplemental feed and silage. The farm is administered with the objective of profit maximization and minimization of environmental impacts, seeking to maintain economically viable activity and preserve the environment. Management decisions are defined with the support of operational control that collects and stores information necessary to manage pastures and animals. The results showed that the renewability mean of six years (2005 at 2011) is 14.83% (Table 1), indicating a high use of non-renewable resources, which places the environment in risk under these productive conditions. The recommendation is to use of natural resources in a best way, reducing market input costs, thus reducing the value of Y, and improving the Renewability of the milk production.

Table 1 - Index of renewability and data that allowed its calculation.

Index	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Mean
R (sej.ha <sup>-1</sup> .year <sup>-1</sup> )	2.24E+15	3.23E+15	2.65E+15	2.18E+15	3.22E+15	2.88E+15	2.73E+15
N (sej.ha <sup>-1</sup> .year <sup>-1</sup> )	6.80E+13	7.28E+13	6.43E+13	7.42E+13	5.39E+13	5.16E+13	6.41E+13
Y (sej.ha <sup>-1</sup> .year <sup>-1</sup> )	1.80E+16	1.98E+16	2.30E+16	1.46E+16	1.88E+16	1.73E+16	1.86E+16
%R (%)	12.45	16.34	11.55	14.93	17.06	16.66	14.83

Key words: management, milk, natural resources, system, sustainability.