



Efficient dairy farming: good for the environment and profits

Improving the efficiency of milk production could produce significant annual savings and potentially cut the environmental impacts of the industry by up to a third, according to new research from Northwest Spain.

Dairy farms in Galicia represent more than 37 per cent of Spanish milk production and 0.3 per cent of European production. But there is growing concern over the sustainability of the dairy industry and recognition of the need to evaluate its economic and environmental impacts in order to make improvements.

The study used a novel complex technique, which combines Life Cycle Assessment (LCA) and Data Envelopment Analysis (DEA), to score and compare 72 dairy farms across Galicia in terms of their eco-efficiency. Of the 72 farms, 41 were classed as inefficient.

The efficiency score depended on the consumption levels of each input to the system during milk production (e.g. animal feed, fertiliser, chemicals, water, diesel and electricity) and the amounts produced of each output (e.g. raw milk product, waste treatment, plastic waste and direct emissions).

Environmental 'hot spots', i.e. the processes contributing the most to the overall environmental impact, were found to be feed production and direct emissions from livestock. The low-efficiency scores were linked to farms with low milk production. However, the most efficient farms were not necessarily those with the largest production, which indicated that efficient practices could be adopted by all farms regardless of size.

As part of the analysis, the researchers calculated ideal target values for each process in the inefficient farms, and modelled the impact of applying these target values to low-scoring farms. The results suggested that the overall environmental impacts could be reduced by 23-30 per cent in all five impact categories tested: (1) non-renewable energy demand, (2) global warming potential, (3) land competition, (4) acidification and (5) eutrophication.

The scientists estimated that the potential economic gain from optimising efficiency in this way was €0.13 per litre of milk produced, which is equivalent to an extra profit of 40 per cent on the price for the raw product. The outcomes of the research support the recently launched EU-funded Geronimo II-Biogas project¹, which will work closely with farmers to pilot new techniques that use Biogas as a cleaner energy source.

Knowing the relative economic and environmental gains of moving from inefficient to efficient farming practices will help decision-makers to focus legislation where it is likely to be most effective. The researchers recommend that the most efficient farms identified in this study are used as 'benchmarks for an environmental legislation framework and that the same method is consistently used in future assessments.

1. See: http://ieea.erba.hu/ieea/page/Page.jsp?op=project_detail&prid=2458

Source: Iribarren, D., Hospido, A., Moreira, M-T., Feijoo, G. (2011). Benchmarking environmental and operational parameters through eco-efficiency criteria for dairy farms. *Science of the Total Environment*. 409: 1786-1798.

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